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# Pre-Linnaean references for the Macaronesian flora found in Leonard Plukenet's works and collections

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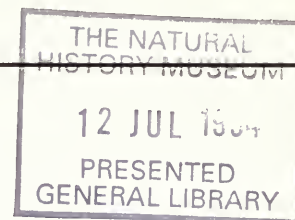
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**SYNOPSIS.** A review of early references to the flora of the Macaronesian region has been carried out through the study of Plukenet's publications and his herbarium collection, now part of the Sloane Herbarium in The Natural History Museum in London. A total of 97 descriptions and 54 drawings of Macaronesian plants has been located in the four published works of this English herbalist that appeared between 1691 and 1705. 131 specimens from Macaronesia representing 87 taxa have been found in his collection; 33 of them do not have obvious descriptions in his published works and five descriptions, supposedly of Canarian plants, seem to have been incorrectly assigned to this region. Phrase-names described by earlier authors that were cited as synonyms by Plukenet have also been studied but few of them proved to be clearly related to Macaronesian taxa. This study reveals that Plukenet's work provides the single most important pre-Linnaean account of the Macaronesian flora, and his herbarium contains one of the oldest known collections of herbarium specimens from this region. The name *Campanula canariensis* L. (= *Canarina canariensis* (L.) Vatke) is lectotypified.

## INTRODUCTION

The Macaronesian region comprises the archipelagos of the Canary Islands, Salvages, Azores, Madeira and Cape Verde and has strong links with the northwestern parts of Africa from southern Morocco to Cape Verde. Its flora contains a high number of endemics and has been traditionally regarded as a relic of the flora which existed in the Mediterranean basin during the Tertiary age (Sunding, 1979).

The earliest known reference to Macaronesian natural history was given in the first century AD by Pliny 'the elder' who mentioned the abundance of palm and pine trees in 'Canaria' and how, in what seems to be the island of El Hierro, there were 'Ferulae' trees which precipitated water

(Pliny, 1826a; for reviews of Pliny's work and the eastern Atlantic islands see Steffen (1944), Alvarez-Delgado (1945) and Martínez-Hernández (1992)).

The first European visitors who described the region noticed the peculiarities of its flora in accounts that dated from the fourteenth to sixteenth centuries (e.g. Niccoloso da Recco in 1341 (Bonnet, 1943); Bontier & Le Vernier in the early fifteenth century (Cioranescu, 1980); Gómez de Cintra in the mid fifteenth century (Bonnet, 1940); P. Gómez Escudero also in the mid fifteenth century (Morales-Padrón, 1978); A. de Palencia in the late fifteenth century (López de Toro, 1970), Fernandes in 1507 (Santiago, 1947); Díaz-Tanco in 1520 (Rodríguez-Monino, 1934; Del Río-Ayala, 1935); Nicols (1583); Frutuoso (Serra-Ráfols et al., 1964) and Torriani in 1590 (Torriani, 1978) and Espinosa (1594)). Some of these descriptions were based on the original names given by

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the pre-Hispanic inhabitants of these islands. As early as 1341 Niccoloso da Recco found that the bark of some Canarian trees could be used to produce red dyes. Similar accounts were also reported in the early fifteenth century as extensive areas of scrub of 'higüieres' (*Euphorbia balsamifera* Aiton) in Lanzarote and of 'tarajal' (*Tamarix canariensis* Willd.) in Fuerteventura were found by Bontier and Le Vernier respectively (Cioranescu, 1980).

Nevertheless, the earliest published and most complete list of endemics of the Macaronesian region, appears to have been provided by Díaz Tanco in 1520. This Spanish traveller visited the Canary Islands between 1505 and 1520 (Rodríguez-Monino, 1934) and published a list of at least 12 Canarian endemics, using the original pre-Hispanic names such as 'balos' (*Plocama pendula* Aiton), 'thabbaybas', actually 'tabaibas' (*Euphorbia* spp.) and 'tabinaste', actually 'tajinaste' (*Echium* spp.) (Del Río-Ayala, 1935). Analogous descriptions were given by the English trader T. Nicols who mentioned the local Spanish names of 'taybayba', 'barbusano' (*Apollonias barbuja* (Cav.) Bornm. and 'vinatico' (*Persea indica* (L.) Spreng.), for the latter noting that it was a tree 'exceeding heavie, and will not rot in anie water' (Nicols, 1583). However, the most comprehensive account of the Macaronesian flora from the sixteenth century was given by G. Frutuoso in 1590 (Serra-Ráfols et al., 1964). This Portuguese naturalist apparently visited the Canary Islands late in the sixteenth century and not only listed many of their endemics but also briefly described the vegetation of some of the islands.

Most of these works provided descriptions of the Canary pine (*Pinus canariensis* C. Sm.) and the Lauraceae forests and put special emphasis upon the orchil lichen (*Rocella* spp.), the Canary palm (*Phoenix canariensis* Chab.), the dragon-tree (*Dracaena draco* L.) and the rain-tree or 'garoe' (*Ocotea foetens* (Aiton) Baill.) of El Hierro. In addition, these references gave unique records concerning the use of plants by the pre-Hispanic inhabitants of the islands (García-Morales, 1989) which have been confirmed through the study of archaeological remains. There is clear archaeological evidence of the pre-Hispanic use of *Scirpus holoschoenus* L. (syn. *Holoschoenus vulgaris* Link) and *Phoenix canariensis* as textile species (Galván-Santos, 1980; Rodríguez-Santana, 1989), cropping of barley, wheat, lentil, broad bean and grass pea (Del Arco-Aguilar et al., 1991; Martín-Rodríguez, 1992) and the gathering of *Pinus canariensis* seeds, *Pteridium aquilinum* (L.) Kuhn rhizomes (Mathiensen, 1960) and *Visnea mocanera* L. f. fruits (Del Arco-Aguilar et al., 1991). The latter was quoted by early chroniclers as having its fruits eaten raw or used to make a kind of 'honey' or 'wine' known as 'cuche' or 'chacerquen' (P. Gómez Escudero in Morales-Padrón, 1978; Espinosa, 1594).

Furthermore these early Canarians were able to make weapons and tools using wood of *Apollonias barbuja* (Cav.) Bornm., *Juniperus phoenicea* L., *Neochamaelea pulverulenta* (Vent.) Erdtman, *Olea europaea* L. ssp. *cerasiformis* (Webb & Berth.) G. Kunkel & Sunding and *Pinus canariensis* (Diego-Cuscoy, 1961).

Although a definitive study of the European knowledge of the Macaronesian flora between the fourteenth and eighteenth centuries has not yet been undertaken, there are reports which suggest that some of the endemic taxa were well-known by naturalists during this pre-Linnaean period. An example can be found in the *Historia general y natural de las Indias* by Fernández de Oviedo (1548). This renowned naturalist gave an extensive description of the 'rain-tree' on the island of El Hierro. Later, in 1590, Torriani reproduced

an original drawing of one of its branches, which facilitated the botanical identification of this species as *Ocotea foetens* (Maynar, 1943). Similarly, in 1576 Clusius gave a detailed description and drawing of *Dracaena draco* based on a tree which he found growing in Lisbon in the garden of the monastery of 'S. Maria a Gratia' (Arber, 1938).

Besides these references, it is also known that soon after the conquest of the islands some species were used as wood for building and firewood for sugar mills (Parsons, 1981). Plants were also exploited for products such as dyes (from *Parmelia perlata* (Huds.) Ach., *Rocella* spp., *Laurus azorica* (Seub.) Franco), soda (from *Zygophyllum fontanesii* Webb & Berth., *Mesembryanthemum crystallinum* L.), perfumes (from *Convolvulus scoparius* L. f.), medicines (from *Dracaena draco*) and pitch (from *Pinus canariensis*) (Schenck, 1907; Viera y Clavijo, 1808; 1866–1869; Lobo-Cabrera, 1988). A strong trade based on these products was established between the Canaries and the most important European ports during the fifteenth and sixteenth centuries (González-Yanes, 1953; Fernández-Armesto, 1982; Lobo-Cabrera, 1988) and many references to the granting of permission for their exploitation are given in official resolutions from the island council or 'cabildo' (Serra-Ráfols, 1949; Serra-Ráfols & De la Rosa, 1952, 1965, 1970). Mention of Canarian endemics can also be found in those documents that were issued to establish the division of the land after the conquest (Serra-Ráfols, 1978; Moreno-Fuentes, 1988). These documents are known as 'datas' and in them names of Canarian plants are usually given, as the plants were often used to indicate boundaries between different areas.

These few examples are drawn from only a small number of pre-Linnaean references on Macaronesian endemic plants. Further research is needed in order to provide a clearer picture of the state of knowledge of early explorers, herbalists and naturalists of the flora of this region.

Leonard Plukenet was one of the most outstanding botanists of the seventeenth century. With its approximately 2000 plant drawings, his *Phytographia* (Phyt.) was one of the most important pre-Linnaean works containing illustrations of plants. This work was issued in four volumes between 1691 and 1694 (Plukenet, 1691a, 1691b, 1693, 1694) and he also had an extensive herbarium with approximately 8000 specimens (Pulteney, 1790) which was the basis for many of his drawings (Dandy, 1958). This large collection was the result of his enthusiastic acquisition of specimens, particularly of those exotic plants then grown in the most important gardens of Britain. He was also in close contact with most of the British herbalists of the time such as Doody, Cuninghame, Ray, Sloane and Petiver and was in correspondence with other botanists from abroad (Pulteney, 1790). Most of his collection is now at The Natural History Museum in London (BM) where it comprises Volumes 84–105 of the Sloane Herbarium. There are also two unnumbered volumes containing his specimens which are titled 'Herbarium Vivum Plukenetianum' (HVP) and 'Thesaurus Botanicus'. Between 1696 and 1705, Plukenet produced three other works (Plukenet, 1696, 1700, 1705) in which he gave descriptions of the plates illustrated in his *Phytographia* and also listed many more plant species for which drawings were not published. These works are *Almagestum botanicum* (Alm.), *Almagesti botanici mantissa* (Mant.) and *Amaltheum botanicum* (Amalth.) in which the taxa are enumerated alphabetically under their polynomial names. Additional illustrations were included in the last two of these works, and so about 2740



figures can be found in Plukenet's works as a whole. It seems that only those plants regarded as exotic were included in the *Phytographia*, and the other three publications contain the rest of his collection (Pulteney, 1790).

The work of Plukenet was greatly admired by Linnaeus who considered his *Phytographia* to be one of the most extraordinary pieces of botanical illustration then published (Linnaeus, 1736, 1751). Linnaeus himself frequently referred to Plukenet's polynomials in describing and naming many of his own species.

In this paper we will review the publications of this English herbalist in relation to the Macaronesian flora. The aim of this study has been to assess what knowledge of the flora of the region was available to the European herbalists in the seventeenth century.

Manuscripts from Plukenet's collection which are held in the Sloane Collection at the Department of Manuscripts in the British Library (BL) have also been studied (see Scott (1904) for the location of Plukenet's manuscripts in the Sloane Collection).

For most of the species listed in his works, Plukenet referred to plant names given by previous herbalists. However references to these authors were given in an abbreviated form and a key for them was presented in the final part of the *Almagestum*. In order to locate possible previous accounts of the Macaronesian taxa, earlier names cited by Plukenet have also been studied. Nevertheless some of the abbreviated references were not listed in Plukenet's key and we have therefore attempted to trace them through the reviews of botanical literature carried out by Linnaeus (1736), Pritzel (1872), Jackson (1881) and Heller (1959) and through the resources of the British Library and the Libraries of the Royal Botanic Gardens, Kew and The Natural History Museum. A list clarifying the abbreviations encountered in those of Plukenet's descriptions that are covered in our study appears at the end of this paper. It is hoped that this will help other researchers to trace some of the early references mentioned in Plukenet's works.

The possible influence of Plukenet's works on subsequent studies of the Macaronesian flora was analysed by reviewing the utilization of Plukenet's names by Linnaeus (Richter, 1835–1840) and Webb & Berthelot (1836–1850). Further research in this area was undertaken through the study of those identifications of Plukenet's drawings provided by Giseke (1779) and Tenzel (1820) and of Linnaeus' annotated copies of Plukenet's works held at the Linnean Society of London.

Taxonomic determination of phrase-names or polynomials given by Plukenet was undertaken after study of his herbarium collection at the Department of Botany (BM). This was facilitated by the fact that many of the specimens were labelled by Plukenet with references to the plate and figure numbers of his works. Plukenet's handwriting was compared with that found in Dandy (1958) and in his correspondence from the Sloane Collection at the Department of Manuscripts in the BL. For those labels which apparently were not written by Plukenet, specimens were checked with the original illustrations found in his works. Labelled specimens which do not seem to be similar to their respective illustrations are also reported in this study. There are also some collections that do not have an obvious description or illustration in Plukenet's published work and there are also Macaronesian specimens which have no label.

It is hoped that the results presented here will help to

encourage further research concerning early references to the flora of the Macaronesian region and will contribute to the understanding of how the natural history of this area was perceived by European naturalists of the seventeenth century.

**List of abbreviations.** BL = British Library, BM = The Natural History Museum, London (formerly the British Museum (Natural History)), HS = Sloane Herbarium, HVP = Herbarium Vivum Plukenetianum. The following abbreviations refer to the most frequently used references in this study: Alm.: = Plukenet (1696), Amalth.: = Plukenet (1705), Linn. = Linnaeus (1753), Gis. = Giseke (1779), Mant. = Plukenet (1700), Phyt. = Plukenet (1691a, 1691b, 1693, 1694), Ten. = Tenzel (1820), W.B. = Webb & Berthelot (1836–1850).

## TAXA FOUND IN PLUKENET'S WORKS

A total of 97 descriptions of Macaronesian plants has been found in Plukenet's works, and each is listed below. In this list each description is given an entry number followed by the polynomial name used by Plukenet in bold. Text not relevant to the actual description has been omitted, and is indicated by '[. . .]'. Reference to Plukenet's published accounts and illustrations is given after the phrase-name including the appropriate page or plate number (abbreviated as 't.'), the latter being followed by the figure number (abbreviated as 'f.'). Plates from *Almagesti botanici mantissa* and *Amaltheum botanicum* are abbreviated using the code 't.'

Information compiled for each entry is treated under five headings:

- (1) Earlier names and references mentioned by Plukenet (coded as Syn.). Names are given in *italics* followed by the reference author in parenthesis. Untraced names and references are cited as they are found in Plukenet's text followed by '[?]'.
  - (2) Citation of Plukenet's descriptions in works by subsequent authors dealing with the Macaronesian flora (coded as His.). The binomial name with which Plukenet's polynomial has been identified by Linnaeus (1753), Giseke (1779), Tenzel (1820) and Webb & Berthelot (1836–1850) (coded as Linn., Gis., Ten. and W.B. respectively) is given in square brackets.
  - (3) Taxonomic determinations of Plukenet's polynomials (coded as Det.). Labelled specimens used in establishing these determinations (made by us) and their location in HS are given in square brackets. Additional information is given in square brackets. Nomenclature and taxonomy follows Hansen & Sunding (1993); endemic taxa are marked with an asterisk. Illegible handwriting is indicated as [illeg.]. Determinations which are only based on Plukenet's description and not on drawings or specimens from his collection are indicated with '[?]'.
    - (4) Other herbarium specimens (coded as Oth.). Under this heading we list those specimens of Macaronesian taxa found in Plukenet's collection which are not labelled with a corresponding polynomial or a reference to Plukenet's works.
    - (5) Comments (coded as Com.). Under this heading we provide supplementary information including Spanish common names reported by Plukenet, origin of material and other relevant details found in the original description or in

Plukenet's herbarium. This study of Spanish common names given by Plukenet has drawn on the studies of Viera y Clavijo (1866–1869), Ceballos & Ortuño (1951), Kunkel (1971) and Santos-Guerra (1983).

**1. *Acetosa arborescens, subrotundo folio; ex Insulis Fortunatis* Alm.: 8 (1696), Mant.: 3 (1700), Phyt.: t. 252, f. 3 (1694).**

Syn.: *Lunaria magorum Arabum Ital. Lunaria di Magi Arabi* (Lobelius, 1576), *Lunaria magorum Arabum* (Lobelius, 1581), *Lunaria Oxalidis rotundae folio* (Bauhin, 1596), *Oxalis rotundi folia frequentissima: a Rovillio picta, sed non descripta: sorte Lunaria Magorum Arabum* (Pona, 1601), *Lunaria magorum Arabum quid?* (Bauhin, 1623), *Lunaria magorum Arabum* (Bauhin & Cherler, 1651).  
His.: *Rumex lunaria* L. [Linn.; Gis.; Ten.; W.B.].  
Det.: \* *Rumex lunaria* L. [HS 93: 9, 95: 12].  
Oth.: HS 99: 14, HVP: 4.

**2. *Adiantum album Canariense, ramosius* Alm.: 11 (1696).**

**3. *Alsine spuria repens ex Insulis Fortunatis folio Hederae terrestres, molli, & incano* Alm.: 24 (1696), Phyt.: t. 256 (1694).**

Com.: None of the drawings published by Plukenet in Phyt.: t. 256 appears to correspond with the description in the *Almagestum* and we believe that the citing of this plate was an error.

**4. *Amaranthus Siculus spicatus, radice perenni* [ . . . ] *ex Insula Maderensi* Alm.: 26 (1696), Phyt.: t. 260, f. 2 (1694).**

Syn.: *Amaranthus Siculus spicatus, radice perenni* (Boccone, 1674).  
His.: *Achyranthes aspera* L. [Linn.; Gis.; W.B.], *A. argentea* Lam. [Ten.].  
Det.: *Achyranthes aspera* L. [HS 95: 41; 99: 61].  
Oth.: HS 97: 78.

**5. *Anagallidis facie Frutex Canariensis* Alm.: 29 (1696).**

**6. *Anonis viscosa lutea, non spinosa, minor. Ex Insula Pico* Amalth.: 15 (1705).**

Syn.: *Anonis viscosa lutea non spinosa minor Lusitanica* (Hermann, 1698).

**7. *Anonis viscosa lutea mitis capreolata erecta foliis splendentibus glabris* [ . . . ] *ex Insulis Fortunatis ad nos allata est* Mant.: 15 (1700).**

Syn.: Plukenet gave the following synonym: *Anonis (sorte) annua lutea, siliqua glabra breviori* (Morison, 1680). However, the name found in Morison's work is '*Anonis lutea annua recta hirsuta viscosa siliquis hirsutis brevioribus, nobis*'.

**8. *Apocynum arboreum ad Elaeagni faciem accedens Canariense, siliquis binis Nerii aemulis, (Cornicar Insulanis vulgo) apicibus recurvis* Alm.: 35 (1696), Phyt.: t. 260, f. 3 (1694).**

Syn.: *Nelem-pala* (Rheede tot Draakenstein, 1689).  
Det.: *Periploca laevigata* Aiton [HS 99: 83].  
Oth.: HS 95: 55.

Com.: Plukenet reported the common name 'Cornicar'; plants of this species are known as 'cornical' in the Canaries. This species was described twice by Plukenet (see entry 10), this description being based on adult plants.

**9. *Apocynum scandens, angustis Rosmarinae foliis, e Maderaspatan. Nannary-chedde Malabarorum. Huic multum convenit Illud, quod ex Insulis Canarinis, olim nobis transmittebatur, & in Almagesto nostro memoratur* Amalth.: 19, t. 361, f. 1 (1705).**

**10. *Apocynum scandens angusto Rorismarini folio, ex Insulis Fortunatis* [ . . . ] *Henio Hispanis vulgo* Alm.: 37 (1696), Mant.: 17 (1700), Phyt.: t. 261, f. 2 (1694).**

Syn.: *Naru-nindi* (Rheede tot Draakenstein, 1690), *Apocynum Hispanicum frutescens Linariae folio* (Tournefort, 1694), *Apocynum fruticosum scandens, Genistae, Hispanicae facie, floribus luteis odoratis* (Sloane, 1696). According to the description (Mant.: 17) the name *Apocynum (forte) caule tenui alte scandens capsulis echinatis* was used by Banister (1693). However, we have been unable to find this name in this work.

Det.: *Periploca laevigata* Aiton [HS 99: 85].  
Com.: The Spanish common name 'Henio' is mentioned by Plukenet. However, plants of this species are known as 'cornical' in the Canary Islands. The species was described twice by Plukenet (see entry no. 8), this second entry being based on young plants which are morphologically rather different from adult individuals.

**11. *Aquifolium laeve non spinosum, angustiore folio Lauri; ex Insula Palma* Amalth.: 19 (1705).**

Det.: \* *Ilex canariensis* Poir. [?].  
Com.: Determination based on the description and on a specimen found in HS 189: 12 in J. Cuninghams collection from La Palma, made on the island in the late seventeenth century.

**12. *Aquifolium amplissimis foliis Minus corrugatum ex Insulis Fortunatis* Alm.: 38 (1696), Mant.: 18 (1700), Phyt.: t. 262, f. 1 (1694).**

His.: *Ilex platyphylla* Webb & Berth. [W.B.].  
Det.: \* *Ilex perado* Aiton ssp. *platyphylla* (Webb & Berth.) Tutin [HS 95: 60].



13. **Arbor Americana amplioribus subrotundis duris & nervosis foliis, fructu pugni majoris magnitudine. Insulis Fortunatis & Jamaicensibus nostratibus Mamee nuncupatur** [. . .] Mommina, s. Mamee arbore [. . .] **Hujus autem fructus ut Mala-granata sunt putamine corticoso. Mammee Canarinae folijs, & facie, Arbor ex Insula Johanna Alm.: 39 (1696), Mant.: 125 (1700), Phyt.: t. 268, f. 1 (1694), Phyt.: t. 204, f. 2 (1694).**

Syn.: *Mamey* (Nieremberg, 1635), *Anda Brasiliensibus* (Marggraf, 1648), *Arbor vinifera Couton Juglandi similis* (Bauhin & Cherler, 1650).

Det.: *Mammea americana* L. [a herbarium specimen for this species is found in HS 96: 170. It has a label which states 'Mammee vera Arboris loium ex Insula Canarina' and does not have any reference to Plukenet's works. However it resembles the illustration depicted in Phyt.: t. 268, f. 1. There is another specimen in HS 99: 91 which refers to this plate but without any mention of a collection site. The plant given in Phyt.: t. 268, f. 1 (HS 99: 110) is not of *M. americana* and it is not a species from the Macaronesian flora. We can only assume that Plukenet incorrectly assigned the illustration from Phyt.: t. 268, f. 1 to his description of *M. americana*. Plukenet also indicated that the drawing found in Phyt.: t. 204, f. 2 was of this species. However this plate and its corresponding specimen (HS 96: 171) are of *Bosea yervamora* L. which is a Canarian endemic. A description of this species was also provided by Plukenet (for further discussion see entry 15)].

14. **An Arbor mirabilis ex Insula Ferro aquam stillans**  
Mant.: 171 (1700).

Syn.: *Sagapeni est liquor fruticis ferulacei oleandro montano similis, bonum quede colore ex albo* (Manadi & Sylvi, 1598), *Arbor aquam stillans* (Bauhin & Cherler, 1650), *Ombrion nullis aedificiorum vestigiis, habere, in montibus stagnum arbores similis ferulae ex quibus aqua exprimatur, e nigris amara ex candidioribus potui iucunda* (Pliny, 1826a), *In prima earum, cui nomem est Embrion, aedificia nec sunt nec fuerunt, iuga montium stagnis madescent ferulae surgunt ad arboris magnitudinem: earum quae nigrae sunt, expressae liquorem reddunt amarissimum, quae candidae, aquas revolvunt etiam potui accomodatas* (Solinus, 1958), *Ferulae sunt arborescentes, afferente Vossio, Not, in Pompom, Melam* [?], *Sagapenum enim Ferulaceae Plantae gummi Dioscorides tradit. lib. 3. cap 95* [?]. Plukenet also quoted the following description from Galenus (1587) '*Sagapenum enim Ferulaceae Plantae gummi esse. Quam. Panaci similem esse ait*'. However we have been unable to trace it in this publication.

Det.: \* *Ocotea foetens* (Aiton) Benth. & Hook.f. [there is no herbarium specimen for this species in Plukenet's collection, determination has been based on the sixteenth century illustration given by Torriani (1978)].

15. **Arbuscula baccifera Canariensis, Syringae caeruleae foliis, purpurantibus venis, fructu monopyreno. Yerva-mora Hispanorum** [. . .] **Yerva-Mora ab Hispanis quoque dicitur Solanum baccis rubris & aureis; Ipsum tamen Solani ethymon ob quandam in quibusd partibus similitudinem longe pluribus iisque diversissimis stirpium generibus ab eodem Populo imponi consuevit: Affinitas ergo formae & coloris baccarum eo sorsan Hispanos Canariense induxit, ut hujus Arbusculam Yerva Mora (i.e.) Solani titulo insigniverint Alm.: 42 (1696), Mant.: 21 (1700).**

Syn.: *Tilia sorte arbor racemosa, folio longiori subtus albicante nervis purpureis insignito, flore pentapetalo purpureo* (Sloane, 1696).

His.: *Bosea yervamora* L. [Although Linnaeus published this name originally in 1753, he cited Plukenet's polynomial as a synonym only in the twelfth edition of his *Systema naturae* (Linnaeus, 1767); W.B.].

Det.: \* *Bosea yervamora* L. [a herbarium specimen found in HS 96: 171 belongs to this species. Plukenet associated this specimen with the figure in Phyt.: t. 204, f. 2 and the description of entry 13 (Alm.: 39). However his description of *B. yervamora* does not refer to this illustration. In fact in Alm.: 39 he identified it as a species of *Mammea*; this is also confirmed by one of the labels of the specimen which states: 'A Mamee Mamaya s. Momin'. Plukenet's accounts for *B. yervamora* (Alm.: 42, Mant.: 21) are extremely precise in, for example, the citation of the common name used in the Canaries. It is therefore surprising that he did not assign the illustration from Phyt.: t. 204, f. 2 (HS 96: 171) to the description].

Com.: Plukenet reported the use of the name 'Yerba-Mora' in the Canary Islands, where it is known as 'hierbamora', 'yervamora' and 'hediondo'. This name is also mentioned in his description from Alm.: 181, Mant.: 99, namely *Hedera arborea ex argenteo & viridi foliis eleganter variegatis* [. . .] *Neque prorsus abhorres a Yerva Mora Canariensibus Hispanis. Hujus* [. . .] *non autem scandit haec sed erigitur* (= *Hedera helix* L.).

16. **Arbuscula Canariensis Salicis, aut potius Oleae Sylv. Barbadosium foliis & facie, seminibus ad tactum (quando maturis) e capsulis cum strepitu profilientibus, Snap Tree nostratibus vulgo. in Hort. Reg. Sancti Jacobi apud Westmonasterium praeterito anno cura D. Georg. London ex Seminibus natae sunt quamplurimae hujus adolescentes arbusculae** [. . .] **Quoad Vascula seminalia magnam habet convenientiam cum Curini Speciebus Malabarorum Alm.: 44 (1696), Phyt.: t. 313, f. 1 (1694).**

Det.: \* *Justicia hyssopifolia* L. [HS 93: 140].

Com.: From the account of this species it seems that Plukenet based his description on material grown by George London, who was Master Gardener and Deputy Superintendent of the Royal Gardens under William III. The description found in entry 34 also seems referable to *J. hyssopifolia*.



**17. *Arbutus angustiori folio non serrato ex Insulis Fortunatis. Aut potius Cerasus Canariensis Adrachne foliis magis acuminatis, fructu parvo, Fragiformi, monopyreno & Cerasis nostratibus plurimum diversi* Alm.: 49 (1696).**

Syn.: *Morocoks* (Ogilvy, 1671).

Det.: *Myrica faya* Aiton [a specimen of this species is found in HS 95: 104; it does not bear any reference to Alm.: 49 except a label which states 'Arbutus non [illeg.] ex Canarinis'; a tentative determination has been made based on the resemblance of this specimen to Plukenet's original description. It seems that this species was described twice as the description is virtually identical to that found in entry 23].

**18. *Arbutus serratis foliis Canarina, cortice circumrupto, sive duodecies Anni spatio, corticem abjiciens, ex Insula Tenerifa nobis est allata* Alm.: 49 (1696).**

His.: *Arbutus canariensis* Veill. [W.B.].

Det.: \* *Arbutus canariensis* Veill. [there is a specimen of *A. canariensis* in HS 95: 104 which, although not explicitly linked to any page number of the *Almagestum*, bears three labels which agree with the original description from Alm.: 49].

Com.: One of the main features of this species is that individuals change their bark regularly. This was noticed by Plukenet and was mentioned both in the description (Alm.: 49) and on the specimen labels.

**19. *Atriplex angustifolia Canariensis, maritima, dentata, repens. Flos de Alumo Hispanis dicta* Alm.: 61, 399 (1696), Phyt.: t. 326, f. 3 (1694).**

Syn.: *Atriplex angustifolia maritima dentata* (Ray, 1686), *Atriplex argentea dentata curassavica* (Hermann, 1689).

Det.: *Atriplex glauca* L. [there is now no specimen upon which Plukenet's account was based; a tentative determination has been made based on the drawing from the *Phytographia*].

Com.: The use of the common name 'Flos de Alumo' is reported by Plukenet, though plants of *A. glauca* are known in the Canary Islands by the names 'saladillo', 'salado' and 'marisma'.

**20. *Bupththalmum Canariense Leucanthemum, Cotulae foetidae crassioribus foliis, radice, acrisapore, & fervido* [. . .] *Magala ab Insulanis nuncupatur* Alm.: 73 (1696), Phyt.: t. 272, f. 6 (1694).**

Syn.: *Pyrethrum flore Bellidis* (Bauhin, 1623).

His.: *Chrysanthemum frutescens* L. [Linn.: Gis.], *Pyrethrum frutescens* (L.) Gaertn. [Ten.], *Argyranthemum frutescens* (L.) Sch. Bip. [W.B.].

Det.: \* *Argyranthemum frutescens* (L.) Sch. Bip. ssp. *frutescens* [there is a specimen in HS 95: 200 of *A. frutescens* which bears a label which states 'Cotula e Canarinis Ins.' but the material resembles the figure found in Phyt.: t. 272, f. 6. Plukenet incorrectly cited Phyt.: t. 272, f. 5 for this species, and it is Phyt.: t. 272, f. 6 which agrees with the description. Subsequent taxonomic works from Linn., Gis., Ten. and W.B. noted this error and established that the correct drawing for this name is that in Phyt.: t. 272, f. 6].

Oth.: HVP: 28.

Com.: The use of the common name 'Magala' is indicated in the description. This species is known locally as 'mazarza'.

**21. *Campanula Canariensis Regia. s. Medium radice tuberosa, foliis sinuatis, coeßis, Atriplicis aemulis, ternis circa caulem ambientibus, flore amplo pendulo, colore flammeo rutilante* [. . .] *inter Convolvulorum species per incuriam posita, in Hort. Regio Hampton. nunc viget, ubi mende Januario, flores editit* Alm.: 76–77 (1696), Phyt.: t. 276, f. 1 (1694).**

Syn.: *Cachruiaqua* (Hernández, 1651), *Totoncaxoxo coyollin* (Hernández, 1651).

His.: *Campanula canariensis* L. [Linn.; Gis.; Ten.; W.B.]. Det.: \* *Canarina canariensis* (L.) Vatke [HS 95: 133; 99: 161; 102: 160].

Oth.: HS 87: 79; 92: 38; 104: 59; HVP: 33.

Com.: Plukenet reported that plants of this species were cultivated in the Royal Garden at Hampton Court Palace, in south-west London.

### Lectotypification of *Campanula canariensis* Linnaeus

Linnaeus' protologue for this name (Fig. 1) in *Species plantarum* (Linnaeus, 1753) comprises a new diagnostic phrase name (*C. foliis hastatis dentatis oppositis petiolatis, capsulis quinquelocularibus*), the citation of two synonyms from Linnaeus (1738, also cited via van Royen, 1740) and Plukenet (1694, 1696), and the statement 'Habitat in insulis Canariis'. The diagnosis is a modification of that used in his earlier *Hortus cliffortianus* where Linnaeus published an illustration (see Fig. 2), but unfortunately no material exists in either the Clifford or Linnaean (LINN, S, UPS, H, MW) herbaria. Apart from Linnaeus' figure, the only other visual element in the protologue is the Plukenet illustration (see Fig. 3). Although it is perhaps a little more stylized than that executed by Ehret for Clifford (for *Hortus cliffortianus*), it shows the form of the corolla much more clearly, and has the considerable advantage that there is a voucher specimen in the Plukenet Herbarium upon which the illustration was evidently based. Both illustrations undoubtedly belong to the plant known as *Canarina canariensis* (L.) Vatke, so there are no taxonomic complications associated with this choice. Although the Clifford illustration would have been more familiar to Linnaeus, the existence of the voucher material makes us favour instead Plukenet's illustration and we formally choose *Campanula canariensis regia s. Medium radice tuberosa, foliis sinuatis*, . . . Plukenet, *Almagestum Bot.* 76 (1696); *Phytographia* t. 276, f. 1 (1694) as the lectotype

#### \* *Caule subdiviso.*

*canariensis*. 25. CAMPANULA foliis hastatis dentatis oppositis petiolatis, capsulis quinquelocularibus.  
Campanula foliis hastatis dentatis, caule determinate foliolo. *Hort. cliff.* 65. t. 8. *Roy. lugdb.* 247.  
Campanula canariensis regia f. Medium radice tuberosa, foliis sinuatis caeßis atriplicis æmulis ternis circum caulem ambientibus, flore amplo pendulo: colore flammeo rutilante. *Pluk. alm.* 76. t. 276. f. 1.  
*Habitat in insulis Canariis.* 2.

Fig. 1 The original protologue of *Campanula canariensis* Linnaeus (1753).



Fig. 2 Ehret's illustration of *Campanula foliis hastatis dentatis, caule determinate foliose* from Linnaeus' *Hortus Cliffortianus* (1738).



(typotype in Herb. Sloane 99: 161, BM) of *Campanula canariensis* L.

**22. *Carduus Acanthoides*, s. *incanus minor*, *elegans*, ex *Insula Maderensi* Alm.: 85 (1696), Phyt.: t. 274, f. 1 (1694).**

Det.: *Galactites tomentosa* Moench [HS 99: 170].

**23. *Cerasus Canariensis*, *mucronato Lauri angustiore folio*, *fructu parvo Fragiformi*, *Ossiculo tuberculoso*, *monopyreno* Alm.: 95 (1696), Mant.: 43 (1700).**

Syn.: *Morococks* (Ogilvy, 1671).

Det.: *Myrica faya* Aiton [?].

Com.: Description virtually identical to that found in entry 17.

**24. *Cicutae fatuae nostrati similis*, *Planta Maderensis* Alm.: 104 (1696).**

**25. *Cistus latifolia major trinervis incano folio*, *floribus purpureis ex Insula Pico* Mant.: 49 (1700).**

Syn.: *Ledon* (Belon, 1553), *Ledon tertium Cyprium* (Clusius, 1601a), *Cistus Ledon cretense* (Bauhin, 1623), *Cistus Ledon latifolium Creticum* (Bauhin & Cherler, 1651), *Cistus Ledon latifolium Creticum Triumphet* (Cupani, 1696).

**26. *Convolvulus Canariensis*, *longioribus foliis mollibus*, & *incanis*. *Ahilo-porro Salvages Hispanis nuncupatur* Alm.: 114 (1696), Mant.: 54 (1700), Phyt.: t. 325, f. 1 (1694).**

Syn.: *Convolvulus marinus Catharticus foliis Acetosae flore niveo* (Plumier, 1693).

His.: *Convolvulus canariensis* L. [Linn.; Gis.; Ten.; W.B.].

Det.: \* *Convolvulus canariensis* L. [HS 93: 110].

Com.: The common name 'Ahilo-porro Salvages' is mentioned in the description. However *Convolvulus* species bear the common names 'corregüela', 'chaparro', 'guaydil', 'leña noel' whereas the name 'ajo porro' is used for plants of *Allium* spp.

**27. *Convolvulus Canariensis minimus*, *flore ochroleuco*, *semine nigro*. *Hartelauena Indigenis dictus* Alm.: 400 (1696), Phyt.: t. 324, f. 4 (1694).**

His.: *Sarothra gentianoides* L. [Gis.].

Det.: \* *Convolvulus fruticosus* Desr. [there is a specimen without a label of this Canarian endemic in HS 93: 110. It resembles the drawing published by Plukenet and a tentative determination has been made based on it].

Com.: Plukenet mentioned the use of the common name 'Hartelauena' (perhaps a derivation of 'corregüela'). For common names of *Convolvulus* species see entry no. 26. It is worth mentioning that according to the description the species bears yellow flowers, however *C. fruticosus* does not bear flowers with this colour.

**28. *Cupressus nana*, *Canariensis fructu minore*. In *Palma quoque Insula una ex Fortunatis oritur haec arbos* Alm.: 125 (1696), Mant.: 61 (1700).**

Syn.: *Arbor cujus fructus Abhel* (Clusius, 1576), *Habhel* (Clusius, 1601a), *Cupresso similis Arbor in Syria* (Bauhin, 1623), *Uyt Persien kont daar de Gom Taxa* (Rauwolf, 1707). Det.: *Juniperus* cf. *phoenicea* L. [?]

Com.: Determination based on the description. It is noteworthy that a specimen of this species is also found in HS 189: 32 in J. Cunningham's collection from La Palma. We were unable to find an earlier edition of Rauwolf's work.

**29. *Cytisus arboreus*, *Canariensis*, *oblongo folio*, *argentea & holosericea lanugine subtus villosa*, *flore pallidiori* [ . . . ] *Texo Insulanis nuncupatur* Alm.: 128 (1696), Phyt.: t. 277, f. 4 (1694).**

Syn.: *Cytisus albus sylvestris* (Cordus, 1561), *Cytisus Alpinus* (Dalechamps, 1586), *Cytisus albicans, folio Trifolii vulgaris* (Bauhin, 1623).

His.: *Cytisus proliferus* L. f. [W.B.].

Det.: \* *Chamaecytisus proliferus* (L. f.) Link ssp. *proliferus* var. *proliferus* [HS 96: 2].

Com.: Plants of this species are known as 'escobón', Plukenet, however, reporting the common name 'Texo'. The name 'tejo' is used for plants of *Erica scoparia* L. ssp. *platycodon* (Webb & Berth.) Hansen & G. Kunkel.

**30. *Cytisus Canariensis*, *microphyllos*, *angustifolius*, *prorsus incanis* [ . . . ] *Esta Insulanis nuncupatur* Alm.: 128 (1696), Phyt.: t. 277, f. 5 (1694).**

Syn.: *Cytisus minoribus foliis, ramulis tenellis villosis* (Bauhin, 1623), *Cytisus Hispanicus, primus Clusii folio virescente* (Bauhin & Cherler, 1650).

His.: *Teline canariensis* (L.) Webb & Berth. [W.B.].

Det.: \* *Teline canariensis* (L.) Webb & Berth. [HS 96: 2. Plukenet did not give a figure number for this species in his *Almagestum*, but there is a herbarium specimen of *T. canariensis* which bears Plukenet's handwriting and indicating that it relates to Phyt.: t. 277, f. 5].

Oth.: HS 87: 117, 93: 132, 100: 14.

Com.: *T. canariensis* is known in the Canary Islands as 'retamón', 'retama de cumbre' or 'gildana'. However Plukenet reported the common name of 'Esta'.

**31. *Cytisus Canariensis*, *microphyllos*, *cauliculis villosis angustis viridibus foliis* [ . . . ] *Mysalva Insulanis, dicta* Alm.: 128 (1696), Mant.: 63 (1700), Phyt.: t. 277, f. 6 (1694).**

Syn.: *Cytisus Hispanicus siliquis Ornithopodij* (Bauhin, 1620), *Cytisus Montis Calcaris* (Bauhin & Cherler, 1650).

His.: *Genista canariensis* L. [Linn.; Gis.; Ten.], *Adenocarpus foliolosus* (Aiton) DC. [W.B.].

Det.: \* *Adenocarpus foliolosus* (Aiton) DC. [HS 96: 2. Plukenet did not give a figure number for this species in his *Almagestum*, but there is a herbarium specimen of *A. foliolosus* which bears Plukenet's handwriting indicating that it corresponds to fig. 6, and therefore the identifications provided by Linnaeus, Tenzel and Giseke were incorrect. Webb & Berthelot (1842) realised this error in their account of *Genista canariensis* L. and assigned Phyt.: t. 277, f. 5 for *G.*





**Fig. 3** Plukenet's illustration of *Campanula Canariensis regia* s. *Medium radice tuberosa, foliis sinuatis*, from his *Phytographia*, t. 276, f. 1 (1694), the lectotype of *Campanula canariensis* L., *Sp. Pl.* 1: 168 (1753), designated here.





Fig. 4 Plukenet's illustration of *Digitali affinis Canariensis Solidaginis acutis foliis leviter pilosis*, . . . (= *Isoplexis canariensis* (L.) Loud.) from his *Phytographia*, t. 325, f. 2 (1694).



Fig. 5 Voucher material of *Digitali affinis Canariensis Solidaginis acutis foliis leviter pilosis*, . . . (= *Isoplexis canariensis* (L.) Loud.) in Plukenet's herbarium (now part of Herb. Sloane, vol. 100: 18 (BM)).



*canariensis* (see entry 30) and Phyt.: t. 277, f. 6 for *A. foliolosus*. This has been confirmed in our research after the study of the labels found with Plukenet's specimens].

Oth.: HS 100: 14, HVP: 53.

Com.: The common name 'Mysalva' is used by Plukenet, but *Adenocarpus* species are known as 'codeso'.

**32. Digitali affinis Canariensis Solidaginis acutis foliis leviter pilosis, flore aureo cucullato, staminibus croceis cristae cavo accumbentibus ornato [ . . . ] Matera Insulanis vulgo, Hujus folia sunt impense amara** Alm.: 400 (1696), Phyt.: t. 325, f. 2 (1694); see Fig. 4.

Syn.: *Adel-odagam* (Rheede tot Draakenstein, 1689), *Bahel-tsjulli* (Rheede tot Draakenstein, 1689).

His.: *Digitalis canariensis* L. [Linn.; Gis.; Ten.], *Callianassa canariensis* (L.) Webb & Berth. [W.B.].

Det.: \* *Isoplexis canariensis* (L.) Loudon [HS 100: 18]; see Fig. 5.

Oth.: HS 87: 118.

Com.: Plukenet reported the use of the common name 'Matera', however plants of this species are commonly called 'cresta de gallo' or 'dedalera'. The species described in entry 33 also seems to refer to this name.

**33. Digitalis lutea, flore magno, Canariensis** Alm.: 131 (1696).

Syn.: *Digitalis lutea magno flore* (Bauhin, 1623), *Digitalis lutea flore maiore folio latiore* (Bauhin & Cherler, 1651).

Det.: \* *Isoplexis canariensis* (L.) Loudon [?]

Com.: It seems that Plukenet described this species twice (see entry 32).

**34. Ecbolii Indici, s. Adhatodae cucullatis floribus aemula, Hyssopifolia, Planta ex Insulis Fortunatis** Alm.: 132 (1696), Phyt.: t. 280, f. 1 (1694).

Syn.: *Tsjanga-puspam* (Rheede tot Draakenstein, 1689).

His.: *Justicia hyssopifolia* L. [Linn.; Gis.], *Gendarussa hyssopifolia* (L.) Webb & Berth. [W.B.].

Det.: \* *Justicia hyssopifolia* L. [HS 96: 13, 100: 20].

Oth.: HS 87: 122.

Com.: It seems that Plukenet described this species twice (see entry 16).

**35. Echium album Maderense, & Echium Tingitanum procerius, floribus immaculatis** Alm.: 133 (1696), Phyt.: t. 278, f. 5 (1694).

Det.: \* *Echium* cf. *leucophaeum* Sprague & Hutch. [HS 100: 22].

Com.: Although the description is given for a plant from Madeira, the specimen found in HS 100: 22 is a Canarian endemic.

**36. Ficoides Africanum Mesembrianthemum, s. Ficus Aizoides teretifoliis, fuccesis, micis argenteis interspersis, flore carneo ex Insulis Fortunatis. Cosca Insulanis vulgo** Alm.: 149 (1696).

Det.: *Mesembryanthemum nodiflorum* L. [determination based on the Spanish common name reported by Plukenet. It is noteworthy that in HS 96: 123 there is a herbarium

specimen without labels of this species].

Com.: Plants of this species are known as 'cosco' in the Canary Islands, a name extremely similar to that reported by Plukenet – 'Cosca'.

**37. Ficus sylvestris [ . . . ] Hujus ramuli ex Insulis Fortunatis allati** Alm.: 144 (1696), Phyt.: t. 281, f. 1 (1694).

Syn.: *De Caprifichi* (Anguillara, 1561), *Caprificus* (Cordus, 1561), *Ficus sylvestris* (Bauhin, 1623), *Caprificus voratur e sylvestri genere ficus nunquam maturescens* (Pliny, 1826b), *Ficus sylvestris* Dioscoridis [?].

Det.: *Ficus carica* L. [HS 100: 43].

**38. Filicula crispa lanugine hepataci coloris vestita, ex Insulis Fortunatis** Alm.: 150 (1696), Mant.: 77 (1700), Phyt.: t. 281, f. 4 (1694).

Syn.: *Filix minor russa lanugine tota obducta in pinnas tantum divisa raras non crenatas subrotundas* (Sloane, 1696).

His.: *Acrostichum marantae* L. [Linn.; Gis.], *A. velleum* Willd. [Ten.].

Det.: *Cheilanthes catanensis* (Cos.) H.P. Fuchs [HS 100: 52].

**39. Filix Hemionitis dicta, Maderensis Hederae arboreae aliquatenus aemula, s. foliorum basi auriculis binis, utrinque donato** Alm.: 155 (1696), Mant.: 82 (1700), Phyt.: t. 287, f. 4 (1694).

Syn.: *Hemionitis peregrina* (Clusius, 1601b), *Hemionitis peregrina Clusii & aliorum* (Ray, 1686), *Hemionitis peregrina foliorum segmentis sinuatis longioribus & magis acuminatis seu hederae folio anguloso* (Sloane, 1696).

His.: *Asplenium palmatum* Lam. [Ten.].

Det.: *Asplenium hemionitis* L. [HS 100: 51. In HS 96: 44 there is a label without a specimen which states: 'Hemionitis Maderensis hederaefolio base auriculis binis [illeg.] donato'; it seems that it refers to this description].

**40. Filix Hemionitis dicta Maderensis pediculis splendentibus nigris, crenatis foliis Asari rotundioribus crenarum segmentis oblongo quadratis, ob semina adnascentia per ambitum circumcirca reflexis** Alm.: 155, 400 (1696), Mant.: 82 (1700), Phyt.: t. 287, f. 5 (1694); see Fig. 6.

His.: *Adiantum reniforme* L. [Linn.; Gis.; Ten.; W.B.].

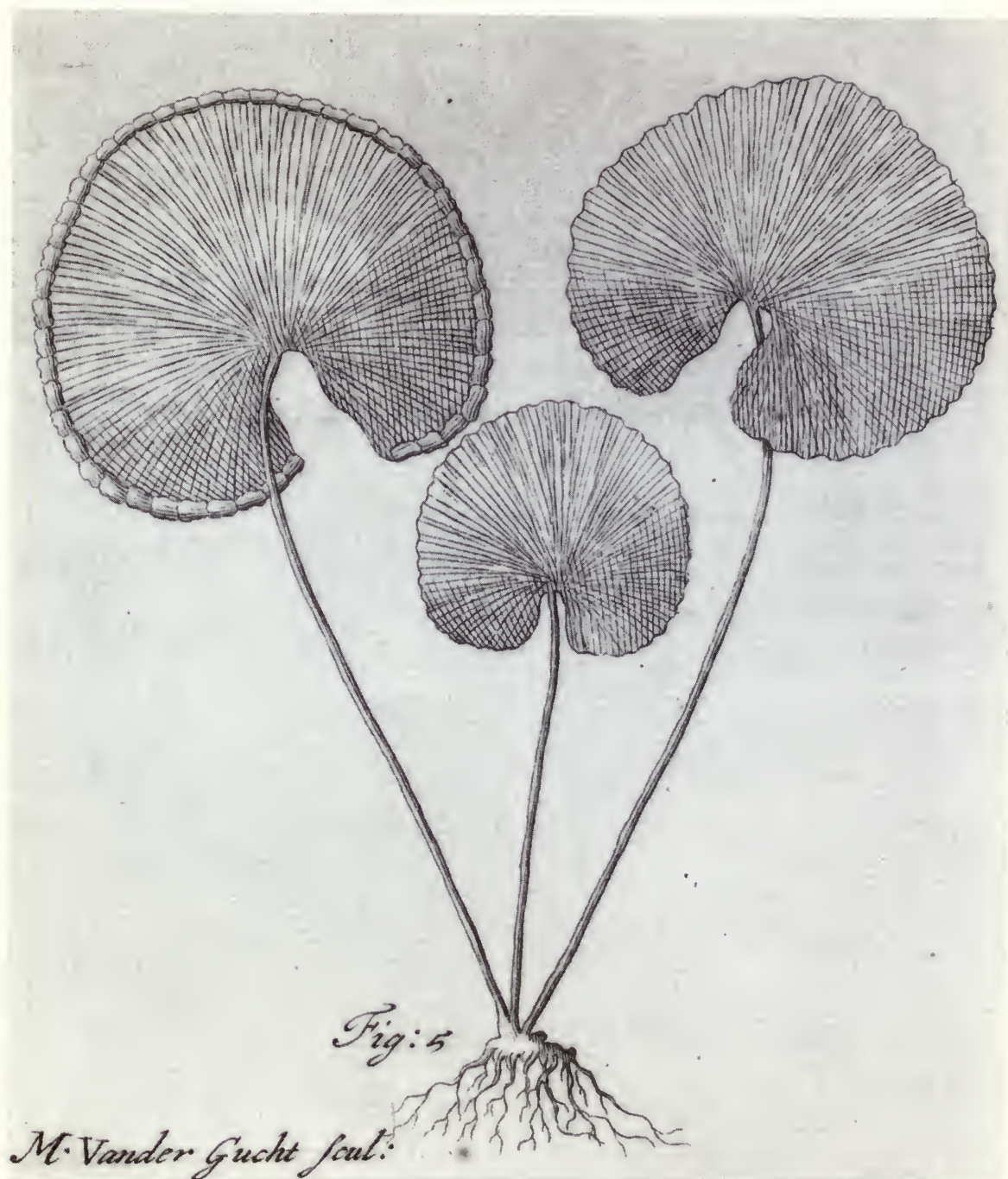
Det.: *Adiantum reniforme* L. [HS 100: 51; see Fig. 7. In HS 96: 44 there is a label without a specimen which states: 'Hemionitis Maderensis pediculis nigris folys Asari rotundioribus' which seems to refer to this species].

**41. Filix ramosa Canariensis Rutae murariae pinnulis angustis, altius incisis, mediae costae alternatim alligatis [ . . . ] Hujus folium totale, (circumscriptione) est sere triangulatum** Alm.: 156 (1696), Phyt.: t. 291, f. 2 (1694).

His.: *Trichomanes canariense* L. [Linn., Gis., Ten.].

Det.: *Davallia canariensis* (L.) J. E. Sm., [HS 93: 169, 100: 61].

Oth.: HS 87: 143, 95: 19.



**Fig. 6** Plukenet's illustration of *Filix Hemionitis dicta Maderensis pediculis splendentibus nigris*, . . . (= *Adiantum reniforme* L.) from his *Phytographia*, t. 287, f. 5 (1694).

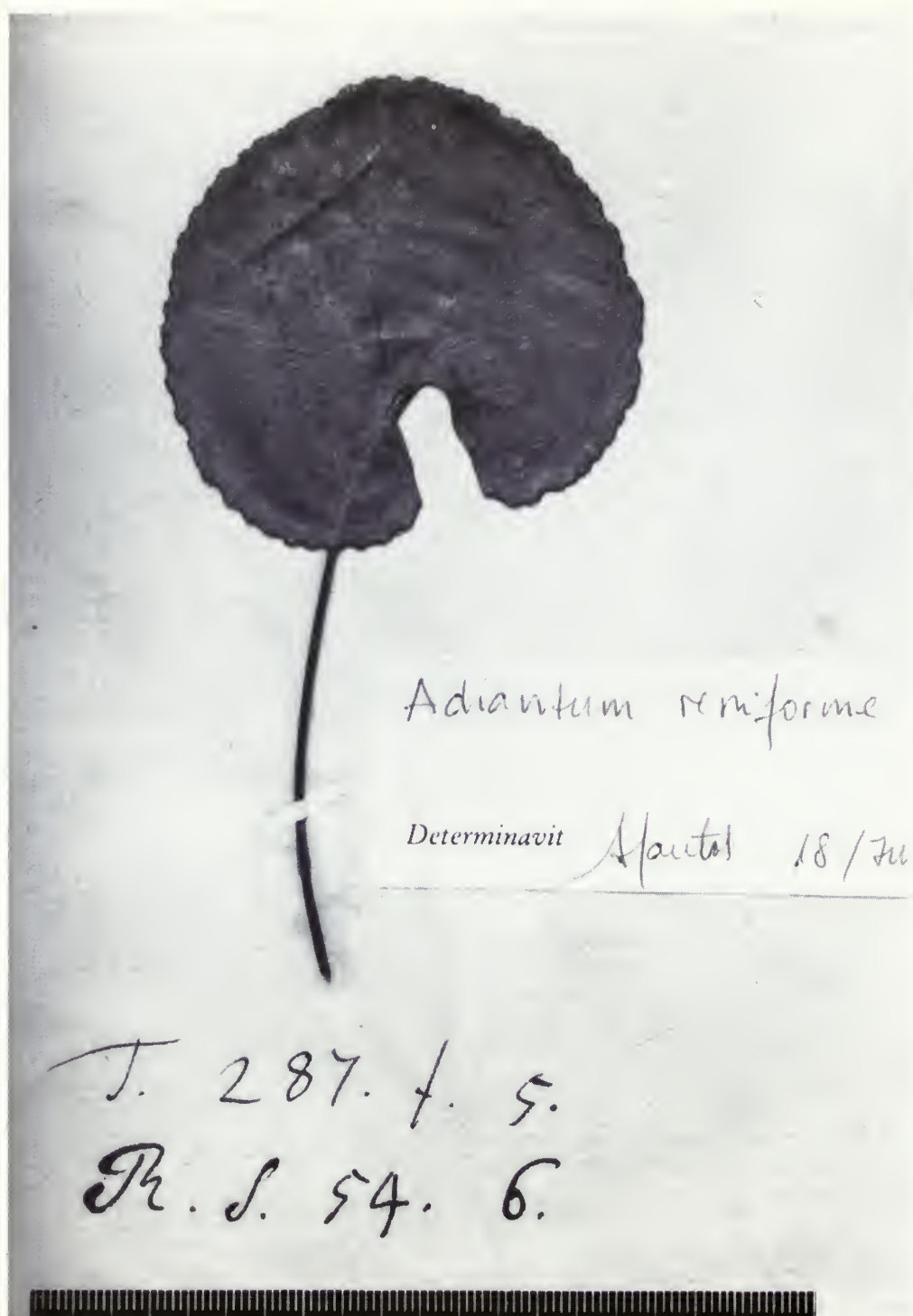


Fig. 7 Voucher material of *Filix Hemionitis dicta Maderensis pediculis splendidibus nigris*, . . . (= *Adiantum reniforme* L.) in Plukenet's herbarium (now part of Herb. Sloane, vol. 100: 51 (BM)).





Fig. 8 Plukenet's illustration of *Horminum hastatis amplioribus foliis, s. Ari modo alatis, . . .* (= *Salvia canariensis* L.) from his *Phytographia*, t. 301, f. 2 (1694).



Fig. 9 Voucher material of *Horminum hastatis amplioribus foliis*, s. *Ari modo alatis*, . . . (= *Salvia canariensis* L.) in Plukenet's herbarium (now part of Herb. Sloane, vol. 100: 138 (BM)).



42. **Filix Saxatilis pervenusta, foliis punctatis, s. Adiantum Maderense folio Filicis, caule tenui candicante** Alm.: 150 (1696), Phyt.: t. 284, f. 4 (1694).

Syn.: *Filix pulverulenta pinnulis obtuse dentatis* (Plumier, 1693).

Det.: *Cystopteris* cf. *fragilis* (L.) Bernh. [HS 96: 40].

43. **Foeniculum dulce Azoricum; a communi dulci differt radiorum umbellae magnitudine, & longitudine, umbella concava, seminibus grandioribus** Alm.: 157 (1696).

44. **Geranium Cretico simile minus incanum acupusilla, ex Insulis Fortunatis** Alm.: 169 (1696).

45. **Geranium Hispanicum magna radice, Cicutae folio crassiori, [. . .] Insulis etiam Fortunatis reperitur, in quibus collectum suit, & nobis allatum** Alm.: 169–170 (1696).

Syn.: *Geranium Cicutae folio aculongsissima* (Bauhin, 1620, 1623), *Geranium Hispanicum magna radice Cicutae folio crassiori* (Sherard, 1689).

46. **Geranium saxatile procumbens, foliis subtus canescentibus, flore majore candicante, ex Insula Pico. Cura industrii Hortulani Johannis Adams in Hort. Comptoniano, ex seminibus enutritam conspeximus** Mant.: 89–90 (1700).

Syn.: *Tlatlahauh capatli Oxygeranio Mex.* (Hernández, 1651).  
Com.: It seems that Plukenet based his description on plants from John Adams, Gardener to the Duke of Beaufort, presumably obtained from Henry Compton's Garden at Fulham Palace in London (Rohde, 1932).

47. **Gramen Canarium Ischaemi paniculis** Alm.: 175 (1696).

Syn.: *Gramen dactylon folio arundinaceo majus: aculeatum sorte Plinij* (Bauhin, 1623; Ray, 1688a), *Gramen Canarium Ischaemi paniculis* (Parkinson, 1640), *Gramen repens cum panicula Graminis Mannae* (Bauhin & Cherler, 1651), *Gramen legitimum* (Magnol, 1676).

48. **Helleborine similis Canariensis. Flos Spiritus Sancti, vulgo** Alm.: 183 (1696).

Syn.: *Flos Spiritus Sancti* (Hermann, 1689).

Com.: The common name 'Flos Spiritus Sancti' is given. Plukenet referred to a *Helleborine* similar to that from the Canary Islands, though as there is no mention of a *Helleborine Canariensis* in any of his works (but only to a '*Helleborine Canadensis*'), it is likely that this citation was a typographic error.

49. **Horminum hastatis amplioribus foliis, s. Ari modo alatis, caulibus & pediculis araneosa lanugine villosis, ex Insula Gomera quae una est ex Fortunatis [. . .] Mustazi Insulanis & Salvia arborea vulgo** Alm.: 185 (1696), Mant.: 103 (1700), Phyt.: t. 301, f. 2 (1694); see Fig. 8.

Syn.: *Sclarea Lusitanica glutinosa amplissimo folio* (Tournefort, 1694).

His.: *Salvia africana* L. [Linnaeus (1762); Gis.], *S. canariensis* L. [Ten.; W.B.].

Det.: \* *Salvia canariensis* L. [HS 100: 138; see Fig. 9].

Oth.: HS 100: 99, 102: 47.

Com.: Linnaeus (1762) cited Plukenet's reference in the synonymy of *S. africana* L. He also identified the drawing from Phyt.: t. 301, f. 2 as *S. canariensis* in his annotated copy of Plukenet's *Phytographia*. The common names 'Mustazi' and 'Salvia arborea' are mentioned by Plukenet for the Canary Islands. However this species is known as 'garitope', 'salvia morisca' or 'salvia'.

50. **Horminum latifolium Canariense pilosum, foliis alterno situ pofita non repugnarent, eandem hanc esse plantam suspicarer** Alm.: 185 (1696), Mant.: 103 (1700), Phyt.: t. 301, f. 3 (1694).

Syn.: *Marum Aegyptiorum* (Alpino, 1627).

Det.: \* *Convolvulus canariensis* L. [HS 100: 138].

51. **Hypericum, s. Androsaemum magnum Canariense ramosum, copiosis floribus fruticosum** Alm.: 189 (1696), Phyt.: t. 302, f. 1 (1694).

His.: *Hypericum canariense* L. [Linn.; Gis.], *H. floribundum* Aiton [Ten.], *Webbia floribunda* (Aiton) Webb & Berth. [W.B.].

Det.: \* *Hypericum canariense* L. [HS 96: 104].

52. **Jasminum album trifoliatum flore magno ex Insula Maderensi** Alm.: 195 (1696), Phyt.: t. 303, f. 1 (1694).

Syn.: *Jasminum sorte Azoricum* (Grisley, 1661).

His.: *Jasminum azoricum* L. [Linnaeus (1762); Gis.; Ten.].

Det.: \* *Jasminum azoricum* L. [HS 100: 149].

Com.: A description for this species was also provided by Plukenet in entry 54.

53. **Jasminum Canariense foliis amplioribus laetovirentibus venosis, hirsutis & asperis, umbellatis Schetti floribus purpureis, ex caliculis inflatis, prorumpentibus. Ex Insulis Fortunatis nobis advecta. At ex India Orientali; ad D. Petiver allata est** Alm.: 196 (1696).

Det.: \* *Viburnum tinus* L. ssp. *rigidum* (Vent.) P. Silva. [our determination is based on a specimen found in HS 100: 150 whose label states 'From Ins. Canaries, Jasminum'. The description provided by Plukenet agrees with most of the morphological features of this specimen].

**54. *Jasminum Azoricum trifoliatum lucidum, acuminatis foliis, flore albo odoratissimo, flexilibus & obsequiosis Virgulis. A Jasmino flavo odoratissimo maxime diversum*** Amalth.: 123, t. 423, f. 6 (1705).

Det.: \* *Jasminum azoricum* L. [HS 93: 210].

Com.: The description found in entry 52 also refers to this species.

**55. *Kali aizoides Canariense procumbens, Portulacae pallescentibus succulentis foliis, aspergine rorida perpetuo madidis* [ . . . ] *Poita Camilo Insulanis dictum; Haec species est ad caulium nodos prolifera cum floribus sere inconspicuis*** Alm.: 202 (1696), Phyt.: t. 303, f. 4 (1694).

His.: *Aizoon canariense* L. [Linn.; Gis.; Ten.; W.B.].

Det.: *Aizoon canariense* L. [there is a herbarium specimen in HS 100: 42 which is similar to the figure given by Plukenet (Phyt.: t. 303, f. 4), it has a label which follows the description (Alm.: 202) but states that the specimen is from 'Ind. Or.'. Furthermore in HS 100: 92 there is a label without a specimen that states 'Kali aizoides procumbens lichenides folio ex Insulis Fortunatis'; it is likely that this label belongs to the specimen found in HS 100: 42].

Com.: The use of the common name 'Poita Camilo' (it may be a derivation of 'pata (de) camello') is indicated by Plukenet. Actual common names for this species are 'pata perro' or 'patilla'.

**56. *Laurifolia Canarina diphyllus* [ . . . ] *Sorte Nimbo Javanensium prima*** Alm.: 211 (1696), Phyt.: t. 305, f. 1 (1694).

Syn.: *Lauro Indica* (Bontius, 1658).

Com.: There is a herbarium specimen in HS 96: 143 associated with Plukenet's figure, but the specimen does not belong to any species of the Macaronesian flora.

**57. *Laurotaxa epiphyllocarpos, crenatis foliis, maxima, e singulis foliorum crenis, baccifera. Ex Insula Palma; nuper allata est*** Mant.: 114 (1700).

His.: *Ruscus androgynus* L. [Linnaeus published this name in 1753. However, he referred to Plukenet's polynomial only in his earlier *Hortus cliffortianus* (Linnaeus, 1738)], *Danae androgyna* (L.) Webb & Berth. [W.B.].

Det.: \* *Semele androgyna* (L.) Kunth [?].

Com.: Specimens of this species have not been found in Plukenet's herbarium; this tentative determination is based on the original description and on information provided by Linnaeus (1738) and Webb & Berthelot (1847). Also, J. Cunningham collected plants of this species during his stay in La Palma in the late seventeenth century, one of which is found in HS 189: 25.

**58. *Laurus Azorica pallidioribus & latioribus foliis, inodora*** Alm.: 210 (1696), Phyt.: t. 199, f. 3 (1693).

Syn.: *Laurus* [ . . . ] *Pompeius Lenaeus adjecit quam mustacem appellavit, quoniam mustaceis subjiceretur. Hanc esse folio maximo, flaccido que et albicante* (Pliny, 1826c).

Com.: The specimen found in HS 96: 139 has a label which

refers to Phyt.: t. 199, f. 3, but it cannot be identified with any Macaronesian species.

**59. *Laurus Indica*** Alm.: 210 (1696), Mant.: 115 (1700), Phyt.: t. 304, f. 1 (1694).

Syn.: *Laurus Indica* (Aldino, 1625), *Laurus Indica. Indica sive Americana Laurus* (Ferrarius, 1633), *Laurus Americana cujus cortex Cassia ligneae multum assimilatur* (Parkinson, 1640), *Quauh eloxochitl* (Hernández, 1651), *Laurus Regia. Laurier Royal* (Vallot, 1665), *Laurus Americana sive Persea Clusij* (Schuyt, 1672), *Laurus* [ . . . ] *Accessit et regia, quae coepit Augusta appellari, amplissima et arbore et folio* (Pliny, 1826c).

His.: *Laurus indica* L. [Linn.; Gis.; Ten.], *Persea indica* (L.) Spreng. [W.B.].

Det.: \* *Persea indica* (L.) Spreng. [HS 100: 167].

**60. *Laurus Maderensis angustifolia pallida odoratissima, venis foliorum aversa parte magis extantibus*** Alm.: 210 (1696), Phyt.: t. 199, f. 2 (1693).

Com.: The herbarium specimen which corresponds with this figure is found in HS 96: 138 but it does not belong to any Macaronesian species.

**61. *Laurus Regia odoratissima Maderensis*** Alm.: 210 (1696).

Syn.: *Laurus latifolia Azorica, Cinamomi odore* (Commelin, 1689), *Laurus Regia odoratissima Maderensis* (Hermann, 1689).

**62. *Lavandula maritima Canariensis spica multiplici caerulea*** Alm.: 209 (1696), Phyt.: t. 303, f. 5 (1694).

His.: *Lavandula multifida* L. [Gis.], *L. abrotanoides* Lam. [Ten.].

Det.: \* *Lavandula buchii* Webb [HS 96: 134, 96: 135].

**63. *Limonium parvum Bellidis minoris folio*** Alm.: 221 (1696).

Syn.: *Limonium pumilum* (Clusius, 1601b), *Limonium parvum bellidis minoris folio* (Bauhin, 1623), *Limonium minus bellidis minoris folio. Petit Limonium a feuilles de Marguerite* (Dodart, 1676).

His.: *Statice limonium* L. [Linn.].

Det.: \* *Limonium pectinatum* (Aiton) Kuntze [HS 96: 149. The original description does not mention any of the Macaronesian Islands. However the specimen has a label (i.e. 'Limonium parvum Bellidis minoris folio CBP Limon. pumilum Clus. ex Insula Canarina') which follows the phrase-name from Alm.: 221 and also refers to the Canary Islands].

**64. *Linariae similis, Arbuscula Canariensis, latiore folio viridi*** Amalth.: 133 (1705).

Det.: \* *Kleinia neriifolia* Haw. [?].

Com.: This description is similar to that of entry 65, and we believe that it refers to vigorous plants with broader leaves.



65. **Linariae similis Arbuscula Canariensis, folio longiore carnosio fragili, fubtus purpurascente Crithmum recipiens** Alm.: 223 (1696), Mant.: 118 (1700), Phyt.: t. 304, f. 3 (1694).

Syn.: *Plantae Lavendulae folio* (Clusius, 1605), *Frutex Indiae Orientalis Lavendulae folio* (Bauhin, 1623), *Arbor Lavendulae folio* (Bauhin & Cherler, 1650), *Texioquahoitl* (Hernández, 1651).

His.: *Cacalia kleinia* L. [Linnaeus published this name in 1753. However he quoted Plukenet's polynomial only in his earlier *Hortus cliffortianus* (Linnaeus, 1738)].

Det.: \* *Kleinia neriifolia* Haw. [this determination is based on Plukenet's drawing and description. However there is also a herbarium specimen in HS 102: 86 without a label which belongs to this species].

66. **Lupinus major villosis foliis Maderensis flore albo & purpureo** [. . .] **nostra tamen folia, haud proprie angusta dici merentur** Alm.: 229 (1696), Mant.: 120 (1700).

Syn.: *Lupini albi in quorum genere reperiuntur maximi, flore antequam aperiatur, subcaeruleo intus vero albo* (Camerarius, 1588), *Lupinus sativus major, & quartus Clusii, flore e coeruleo purpurascente. Lupinus Aethiopicus quorundam* (Besler, 1613), *Lupinus Indicus medius caeruleus* (Parkinson, 1640), *Lupinus caeruleus minor perennis Virginianus repens, nobis* (Morison, 1680), *Lupinus medius caeruleus* (Ray, 1686), *Lupinus incarnatus* (Hermann, 1687), *Lupinus angustifolius, flore e candido purpureo* (Cupani, 1696).

Det.: *Lupinus albus* L. [?].

67. **Melissa Canarina multifido folio spicata, odorem Camphorae spirans, penetrantissimum** Mant.: 128, t. 430, f. 2. (1705); see Fig. 10.

Syn.: *Katu-kurka* (Rheede tot Draakenstein, 1690), *Moldavicae Species trifolia, ex America, nuper ad nos missa* Turnefort. de opt. Meth. instituend in re Herber epist. ad Sherard. pag. 18 [?].

His.: *Chrysanthemum indicum* L. [Ten.].

Det.: \* *Cedronella canariensis* (L.) Webb & Berth. [HS 101: 13, upper specimen].

Com.: It appears that this species was described twice by Plukenet (see entry 69).

68. **Melissa (forte) an Mentha viridis. Haec autem Melissa non est, sed re vera ad Mentharum genera accenseri meretur, & nominari licet Mentha pilulifera Betonicae forma, & odore aromatico, ex Insulis Fortunatis. Polihomons Insulanis dicta** Alm.: 247 (1696), Mant.: 127 (1700), Phyt.: t. 307, f. 1 (1694).

Syn.: *Yxiayaboal Chapaltepecensis* (Ray, 1688b), *Melissa elatior foliis magnis dentatis glabris ad genicula binis, flores odoratos luteos patulos stamina bina quasi cornua protrudentes, in summitate caulium ramatim serens* (Banister, 1693). Det.: \* *Bystropogon canariensis* (L.) L'Hér. [there is an unlabelled specimen corresponding with this species in HS 101: 15 which resembles the drawing depicted by Plukenet in Phyt.: t. 307, f. 1; a tentative determination is based on this specimen].

Oth.: HS 88: 73; 96: 187.

Com.: *Bystropogon* species are known in the Canaries as 'poleo de monte' o 'poleo monte', this agrees with Plukenet's description as he reported on the use of the word 'Polihomons'. Two different descriptions which seem referable to this species have been found in Plukenet's works (see also entry 70).

69. **Melissa forte Canarina triphyllus odorem Camphorae spirans penetrantissimum** Alm.: 401 (1696), Phyt.: t. 325, f. 5 (1694).

Syn.: *Aztaxochitl* (Hernández, 1651).

His.: *Dracocephalum canariense* L. [Linn.; Gis.], *Cedronella canariensis* (L.) Webb & Berth. [W.B.].

Det.: \* *Cedronella canariensis* (L.) Webb & Berth. [HS 101: 13, lower specimen].

Oth.: HS 88: 71; 94: 14; HVP: 120.

Com.: The description found in entry 67 also refers to this species.

70. **Melissophyllum citratum ex Insulis Fortunatis, Lingo-veha ab Insulanis dictum** Alm.: 247 (1696), Phyt.: t. 306, f. 4 (1694).

Det.: \* *Bystropogon* cf. *canariensis* (L.) L'Hér. [determination based on the drawing provided by Plukenet; however, there is also an unlabelled specimen in HS 101: 14 which resembles this figure].

Com.: The use of the common name 'Lingo-veha' is indicated for this entry. However plants of this species are known as 'poleo de monte' or 'poleo monte'. Another description which seems to refer to this species can be found in entry 68.

71. **Mentha Maderensis Insulae, minus odorata** Alm.: 248 (1696).

72. **Mentha sylvestris Azorica longioribus foliis incanis, spica longiore & crassiore** Alm.: 248 (1696).

73. **Mentha Canariensis frutescens, foliis subtus lanugine candidissima, villosis floribus glomeratis e sinu foliorum longioribus pediculis insidentibus** Alm.: 248 (1696), Phyt.: t. 307, f. 2 (1694).

His.: *Mentha canariensis* L. [Linn.; Gis.], *Bystropogon canariensis* (L.) L'Hér. [Ten.; W.B.].

Det.: \* *Bystropogon plumosus* (L. f.) L'Hér. [HS 96: 186].

Oth.: HS 101: 18 [although this specimen is badly preserved, it resembles the drawing given by Plukenet in Phyt.: t. 307, f. 2].

Com.: The phrase-name found in entry 74 also seems to refer to this species.

74. **Mentha Canariensis, minore folio subtus incano, ramosissimus** Alm.: 248 (1696).

Det.: \* *Bystropogon plumosus* (L. f.) L'Hér. [HS 96: 186. The specimen is not explicitly linked with Alm.: 248 but it does have a label which states 'Mentastrum incanum canariensis minore folio ramosiss' which follows this entry].

Com.: It seems that Plukenet provided another description for this species in entry 73.



Fig. 10 Plukenet's illustration of *Melissa Canarina multifido folio spicata. odorem Camphorae spirans, penetratissimum* (= *Cedronella canariensis* (L.) Webb & Berth.) from his *Phytographia*, t. 430, f. 2 (1705).



**75. *Muscus arboreus aurantiacus*, staminibus tenuissimis, ex Insulis Fortunatis [ . . . ] Totus citrino colore nitet peramaeno** Alm.: 254 (1696), Mant.: 132 (1700), Phyt.: t. 309, f. 1 (1694).

Syn.: *Laricus Muscus* (Bauhin & Cherler, 1650). Plukenet claimed that the name *Muscus arboreus rutilans* was given by Bauhin (1623); there are five polynomials commencing '*Muscus arboreus*' in Bauhin's work but none of them appears in exactly this form.

Det.: *Lethariella canariensis* (Ach.) Krog [HS 97: 4, 101: 31].  
Oth.: HS 92: 94.

**76. *Muscus cinereus*, e ramis Arborum dependens, Canariensis, ex staminibus crassioribus geniculatis, in tenuissima & longissima fila ramulosus. [ . . . ] Tanta copia inveniuntur hi musci apud Virginienses iis praesertim locis, ubi in Maris accessu aquis abundant, ut Hiberno tempore Totas arbores quibus adnascuntur dejiciant, eo quod pabulum Vaccis & ovibus suis praebent gratissimum** Alm.: 254 (1696).

Syn.: *Muscus capillaceus longissimus* (Bauhin, 1623). Plukenet claimed that Clusius (1601) used the name *Muscus capillaceus cineri coloris, e ramis Ilicis dependens*. However, we have been unable to trace this polynomial in either part of this publication.

Det.: *Usnea articulata* (L.) Hoffm. [determination based on Plukenet's description and on an unlabelled specimen found in HS 101: 31 which follows this description].

**77. *Origanum Maderense* nostrati simile odoratus capitulis albicantibus. Gratissimo odore nares perstringit** Alm.: 272 (1696), Mant.: 141 (1700).

Det.: *Origanum vulgare* L. [?].

**78. *Palma prunifera* foliis Juccae, fructu racemoso Cerasi-formi, ossiculo duro cinereo, Pisi magnitudine, Lachrymam Sanguis Draconis dictam fundens** Alm.: 277 (1696).

Syn.: *Dracone arbore* (Clusius, 1576), *Draco* (Clusius, 1601a), *Draco arbor* (Bauhin, 1623; Parkinson, 1640), *Draco arbor et de eius Lacryma, seu sanguine e Draconis cinnabati Veterum* (Bauhin & Cherler, 1650), *Palma prunifera foliis Yuccae, fructu, in Racemis congestis, ceraciformi, duro cinereo pisi magnitudine: hujus lacryma, Sanguis draconis dicta, Draco Arbor, Clusi. Belg. Draken-boom* (Commelin, 1689), *Palma prunifera foliis Juccae fructu racemoso cerasiformi ossiculo duro cinereo pisi magnitudine Lachryman sanguis Draconis dictam sundem* (Kiggelaer, 1690).

Det.: \* *Dracaena draco* (L.) L. [a herbarium specimen found in HS 91: 31 has a label agreeing with Plukenet's name].

**79. *Papaver corniculatum rubrum minus* ex Insulis Fortunatis. Mahopola Insulanis dictum** Alm.: 279 (1696).

Det.: *Papaver rhoeas* L. [?].

Com.: The common name 'Mahopola' is reported by Plukenet. Plants of *Papaver* spp. are called 'amapola' in mainland Spain and the Canaries.

**80. *Peucedani folio Planta Maderensis* Alm.: 289 (1696).**

Syn.: *Planta frutescens Africana perrara, foliis Peucedani, floribus conglomeratis Herbae castae Americanae nonnihil similibus* (Breyne, 1678b).

**81. *Phaseolus teneri folius, fructu coccineo. ex Insulis Fortunatis a D.D. Uvedal accepimus* Alm.: 291 (1696).**

Det.: *Phaseolus vulgaris* L. [?]

**82. *Polygonum Juncoide Scoparium ex Insulis Fortunatis* Alm.: 303 (1696), Phyt.: t. 311, f. 3 (1694).**

Syn.: *Alsine alpina junceo folio* (Bauhin, 1620, 1623).

Det.: \* *Plocama pendula* Aiton [HS 97: 117].

**83. *Polygonum ex Insula Palma, Serpylli foliis ad genicula confertis, argentea coma paleacea* Mant.: 154 (1700).**

Det.: *Polygonum maritimum* L. [?]

Com.: Determination based on the description and on the fact that J. Cunningham collected plants of this species during his stay in La Palma in the late seventeenth century. A specimen is in HS 189: 12 in Cunningham's collection from this island. Plukenet also refers to this species in a phrase name found in Alm.: 122 (illustrated in Phyt.: t. 277, f. 3); his description is '*Cruciatae marinae similis, Planta Indiae orientalis [ . . . ] Huic valde similis es Insula Palma nuper est allata plantula, cui nomem dedi Polygonum Serpylli foliis, ex adverso binis, sericea coma candicante*'. There is no herbarium specimen for this name.

**84. *Ranunculus Canariensis hirsutus grumosa radice Platani sere foliis, flore pallide luteo majore* Alm.: 313 (1696).**

Syn.: *Ranunculus creticus latifolius* (Clusius, 1601a), *Ranunculus asphodeli radice Creticus* and also *Ranunculus lanugin. apii folio asphodeli radice* (Bauhin, 1623), *Ranunculus alter saxatilis Asphodeli radice* (Parkinson, 1640).

Det.: \* *Ranunculus cortusifolius* Willd. [label for the specimen of *R. cortusifolius* is found in HS 97: 144 and quotes the description given by Plukenet in Alm.: 313].

**85. *Rubia arborescens asperior Insularum Canariensium, foliis ad singula genicula ternis [ . . . ] Nettle-Tree a Mercatoribus dicta* Alm.: 323 (1696), Phyt.: t. 311, f. 4 (1694); see Fig. 11.**

Det.: \* *Rubia fruticosa* Aiton ssp. *fruticosa* [HS 97: 171; see Fig. 12].

**86. *Saamounae Brasiliensium floribus aemula, Arbor Salvifolia sericea, dipetaloides, ex Insulis Fortunatis* Alm.: 326 (1696), Mant.: 164 (1700), Phyt.: t. 313, f. 2 (1694).**

Syn.: *Teucroides filiculosum foliis laurinis, floribus, galeatis & labiatis* (Sloane, 1696).

Det.: \* *Teucrium heterophyllum* L'Hér. [HS 98: 1].





**Fig. 11** Plukenet's illustration of *Rubia arborescens asperior Insularum Canariensium*, . . . (= *Rubia fruticosa* Aiton ssp. *fruticosa*) from his *Phytographia*, t. 311, f. 4 (1694).





Fig. 12 Voucher material of *Rubia arborescens asperior Insularum Canariensium*, . . . (= *Rubia fruticosa* Aiton ssp. *fruticosa*) in Plukenet's herbarium (now part of Herb. Sloane, vol. 97: 171 (BM)).



Fig. 13 Plukenet's illustration of *Solanum tomentosum Canariense spinosum*, fructu *Cerasorum* forma & magnitudine . . . (= *Solanum vespertilio* Aiton) from his *Phytographia*, t. 316, f. 3 (1694).

87. *Salicis folio Canariensis Arbuscula impatiens* [ . . . ] s. *Arbor crepitus*; The Snap-Tree nostratibus, & Satterel Insulans dicta. Ab Ecbolii Indici s. *Adhatodae*, cucullatis floribus *Aemula*, Hujus ex iisdem locis, parum diversa. Eademque est, cum *Arbuscula Canariensi Salicis* aut potius *Oleae Sylv. Barbados. folio & facie*, & c. Alm.: 328 (1696), Mant.: 165 (1700).

Syn.: *Apancholoa* (sorte) sive *Herba lymphis infiliens* Nier-  
amberg. de Exotic fol. 351 [?].

Com.: The use of the common name 'Satterel' is indicated in this description, but we have been unable to link this common name with any Canarian species.

88. *Salvia auriculata*, mucronatis foliis crassis, lanuginosa, appendicibus aucta Alm.: 329 (1696), Phyt.: t. 57, f. 3 (1691).

Det.: *Salvia* sp. [HS 97: 184. The phrase-name does not give any reference to Macaronesia. However, labels from the herbarium specimen refer both to Phyt.: t. 57 f. 3 and to the Canary Islands (i.e. 'Sage. *salvia trifoliada Canariensis*') and Plukenet's drawing from *Phytographia* is extremely similar to this specimen. However, the material belongs to a species that does not occur in the Canary Islands and it is likely that it was wrongly assigned there by Plukenet].





Fig. 14 Voucher material of *Solanum tomentosum Canariense spinosum*, fructu *Cerasorum* forma & magnitudine . . . (= *Solanum vesperitilio* Aiton) in Plukenet's herbarium (now part of Herb. Sloane, vol. 98: 57 (BM)).



Fig. 15 Plukenet's illustration of *Tithymalus aizoides lactifluus* s. *Euphorbia Canariensis*, *quadrilatera*, & *quinquelatera* Cerei effigie . . . (= *Euphorbia canariensis* L.) from his *Phytographia*, t. 320, f. 2 (1694).





Fig. 16 Voucher material of *Tithymalus aizoides lactifluus* s. *Euphorbia Canariensis*, *quadrilatera*, & *quinquelatera* Cerei effigie . . . (= *Euphorbia canariensis* L.) in Plukenet's herbarium (now part of Herb. Sloane, vol. 102: 86 (BM)).

89. ***Salvia sylvestris amplissimis Verbasci foliis, graveolens, flore albo parvo Canariensis inter Delineation.*** [. . .] ***Arvida Salva Insulanis vulgo. Flos ejus galea caret. Facie externa cum Stachyde convenit*** Alm.: 329 (1696).

His.: *Leucophaea canariensis* (L.) Webb & Berth. [W.B.].

Det.: \* *Sideritis canariensis* L. [?]

Com.: There is neither a drawing nor an obvious specimen for this entry. The description is extremely similar to that of entry 95 and our determination is based upon that. The common name 'Arvida Salva' is given by Plukenet, however *Sideritis* species are known as 'chahorra' and 'salvia blanca' in the Canary Islands.

90. ***Sedum majus Canarinum*** [. . .] ***pilis ad oras foliorum hispidis argenteo-lucidis fimbriatum floribus ex flavo pellescentibus, per ramos numerosissimos recurvatos eleganti serie dispositis*** [. . .] ***Corozone Celio ab Insulanis dictum*** Alm.: 340 (1696), Mant.: 169 (1700), Phyt.: t. 314, f. 1 (1694).

His.: *Sempervivum canariense* L. [Linn.; Gis.; Ten.], *Aeonium canariense* (L.) Webb & Berth. [W.B.].

Det.: \* *Aeonium tabulaeforme* (Haw.) Webb & Berth. [determination based on Plukenet's description and illustration. Nevertheless, one herbarium specimen without a label is found in HS 101: 201].

Com.: The common name 'Corozone Celio' (perhaps a derivation of 'corazoncillo') is reported in this description. The common name 'corazoncillo' is used for *Lotus* species whereas plants of *Aeonium* are known as 'pastel de risco', 'oreja del abad', 'verol' or 'bejeque'.

91. ***Sedum maximum villosum ex Insulis Fortunatis La Frecho de las uvas Insulanis dictum*** Alm.: 339 (1696).

Syn.: *Sedum maximum arborescens, latifolium, flore flavo, Capituli Bonae Spei, D. ten Rh.* (Breyne, 1678a).

Com.: Plukenet gave the common name 'La Frecho de las uvas' for plants of this species. No obvious Spanish common name has been found which could be related to that reported by Plukenet.

92. ***Sideritis canariensis Mocanes dicta, folio subtus incano, margine spinulis asperato, calyculis tomentosis*** Alm.: 346 (1696), Phyt.: t. 315 f. 4 (1694).

His.: *Scutellaria integrifolia* L. [Ten.].

Det.: \* *Forsskaolea angustifolia* Retz. [HS 98: 39].

Oth.: HS 102: 12.

Com.: The common name 'Mocanes' is given in this description. However the name 'mocán' is used, in the Canary Islands, for plants of *Visnea mocanera* L. f. Plants of *F. angustifolia* are known as 'ratonera' or 'hierba ratonera'.

93. ***Simpla-nobla Canariensium, Planta oblongis, amplioribus splendentibus foliis ternis circa caulem ambientibus, venosis*** Alm.: 347 (1696).

His.: *Phyllis nobla* L. [this name was originally published by Linnaeus (1753). However, reference to Plukenet's phrase-name was given by Linnaeus only in *Hortus cliffortianus*

(Linnaeus, 1738)].

Det.: \* *Phyllis nobla* L. [HS 102: 15. We have also found sheets in Miller's (from Chelsea Physic Garden) and Uvedale's herbaria from the late seventeenth and early eighteenth centuries].

94. ***Solanum tomentosum Canariense spinosum, fructu Cerasorum forma & magnitudine*** [. . .] ***Hujus fructus sunt saturate Laccae coloris ex quibus fucum conficiunt Insulanae Mulieres, quo faciem oblinunt, & ex pallida rubicundam efficiunt, ut hoc modo Amasiis suis formosiores reddantur. Bella Donna Canarina spinis armata; Permenton Insulanis vocatur*** Alm.: 351 (1696), Phyt.: t. 316, f. 3 (1694); see Fig. 13.

Syn.: *Planta spinosa incognita* (Bontius, 1658).

His.: *Solanum vespertilio* Aiton [W.B.].

Det.: \* *Solanum vespertilio* Aiton [HS 98: 57; see Fig. 14].

Oth.: HS 88: 122.

Com.: The common name 'Permenton' is given by Plukenet, this follows closely the names used in the Canary Islands: 'pimentero' and 'pimientero'. This description has an ethnobotanical interest as it presents a detailed account on the traditional use of the fruits of this species. Its juice was the basis for a dye which was used as a facial makeup by the Canarian women.

95. ***Stachys amplissimis Verbasci foliis, floribus albis parvis non galeatis, spica Betonicae, ex Insula Canarina*** [. . .] ***Arvida salva Incolis, & nostratibus Sage-Tree (i.e.) Salvia arbor nuncupatur*** Alm.: 356 (1696), Phyt.: t. 322, f. 4 (1694).

His.: *Sideritis canariensis* L. [Linn.; Gis.; Ten.].

Det.: \* *Sideritis canariensis* L. [HS 98: 69; 102: 39].

Oth.: HS 102: 40.

Com.: The use of the common name 'Arvida salva' is reported by Plukenet. This description is extremely similar to that of entry 89 and we believe that both refer to the same species. For a discussion of the use of the common name by Plukenet, see entry 89.

96. ***Tithymalus aizoides lactifluus s. Euphorbia Canariensis, quadrilatera, & quinquelatera Cerei effigie, ad angulos per crebra intervalla spinis rectis atronitentibus, Gazellae cornua referentibus, armata*** Alm.: 370 (1696), Mant.: 182 (1700), Phyt.: t. 320, f. 2 (1694); see Fig. 15.

Syn.: *Quauh cuetz placuítlapilli* (Hernández, 1651), *Euphorbia similis Sadricalli Indorum* (Breyne, 1689), *Rangiseri cornua referens planta Zeylanica*. *Sandricay Zeylan* (Hermann, 1689), *Tithymalus quadrangularis spinosus S. spinis geminis aduncis ex eadem sede ortis armatus, succo lacteo acerrimo turgidus* (Kiggelaer, 1690).

His.: *Euphorbia canariensis* L. [Linn.; Gis.; Ten.; W.B.].

Det.: *Euphorbia canariensis* L. [HS 102: 86; see Fig. 16].



97. ***Tithymalus dendroides* Linariae foliis ex Insula Canarina** Alm.: 369 (1696), Mant.: 181 (1700), Phyt.: t. 319, f. 5 (1694).

Syn.: *Tithymalus perennis* & *procerior lini folio acuto* (Sloane, 1696).

His.: *Othonna tenuissima* L. [Gis.], *O. linifolia* L. f. [Ten.], *Euphorbia regis-jubae* Webb & Berth. [W.B.].

Det.: \* *Euphorbia regis-jubae* Webb & Berth. [we have not found any specimen for this species in Plukenet's herbarium, this determination is based on the drawing from *Phytographia* and on Webb & Berthelot's identification (Webb & Berthelot, 1846–1847)].

## TAXA FOUND IN PLUKENET'S HERBARIUM BUT NOT IN HIS WORKS

A study of the whole of Plukenet's herbarium revealed that there were 34 herbarium specimens for 22 taxa which, although reported as collected in the Macaronesian area do not appear to have been described in Plukenet's works. Material which fell under this category is listed below. An entry number is given for each taxon and within each entry the following headings can be found:

- (1) Taxonomic determination of specimens (coded as Det.:). Endemic taxa are pointed with an asterisk.
- (2) Location of specimens in Plukenet's herbarium (coded as Herb.:). Labels are given in square brackets.
- (3) Comments (coded as Com.:). Additional remarks concerning the specimens are included in this heading.

98. Det.: \* *Apollonias barbuja* (Cav.) Bornm.

Herb.: HS 95: 104; 96: 137 ['*Laurus canariensis odorata*']; 96: 138 ['An tree strawberry of the Canaries']; 100: 167.

99. Det.: *Asparagus* cf. *capensis* L.

Herb.: HS 95: 108 ['*Asparagus pelroa* s. *Corruda aculeata* ex Insulis Canarinis'].

Com.: The label of this specimen refers to Phyt.: t. 78, f. 3 and follows the description found in Alm.: 54 (*Asparagus aculeatus, triplice spina surrectus*). This species does not occur in the Canary Island flora. It is worth mentioning that in HS 95: 108 there is another specimen which, though poorly preserved, resembles the Canarian endemic *A. umbellatus* Link.

100. Det.: \* *Bryonia verrucosa* Dryand.

Herb.: HS 95: 200.

101. Det.: *Calendula arvensis* L.

Herb.: HS 95: 131 ['*Calendula sylv. minima Canariensis*'].

102. Det.: *Centhranthus calcitrapae* (L.) Dufr.

Herb.: HS 98: 127 ['*Valeriana annua* ex Insulis Canarina'].

103. Det.: *Chrysanthemum segetum* L.

Herb.: HS 95: 162 ['*Chrysanthemum* from I. Canaries'].

104. Det.: *Conyza bonariensis* (L.) Cronquist.

Herb.: HS 95: 193 ['From I. Canaries an major [illeg.]' ].

105. Det.: \* *Echium* cf. *leucophaeum* Sprague & Hutch.

Herb.: HS 96: 14 ['*Echium* from I. Canaries'].]

106. Det.: *Erica arborea* L.

Herb.: HS 100: 26 ['An Erica from the Canaries look in my former collections you'll find its name'], 100: 27 ['An Erica 2a Clus. ex Insula Canarina vid autorum'].

107. Det.: *Geranium* cf. *rotundifolium* L.

Herb.: HS 96: 53 ['An Geranium fatid. ex Insula Canarina'].

108. Det.: \* *Gonospermum fruticosum* (Buch) Less.

Herb.: HS 96: 195 ['*Millefol. Tanacetum fol Canariense*'].

109. Det.: *Hordeum vulgare* L.

Herb.: HS 105: 41 ['*Gramen canarium hirsutum*'].

110. Det.: *Laurus azorica* (Seub.) Franco.

Herb.: HS 100: 168.

111. Det.: \* *Lavandula multifida* L. ssp. *canariensis* (Mill.) Pit. & Proust.

Herb.: HS 100: 167.

112. Det.: *Mentha* spp.

Herb.: HS 101: 16 ['*Teucris facie frutice Canariensis floribus ocicuis albis non galeatis* Bobart. Of this saith he I observe 3. varieties suppose this yr. 1<sup>st</sup>. The 2<sup>nd</sup> hath longer leaves with ye shape & green ness of Betony and such flowers as this. The 3<sup>d</sup> is an uprighter plant more wooly and rounder leav'd, which I thinke is at Hampton Court. But by Mr Bobarts leave these 3 are specifically distinct. *Mentha pilulifera* Betonicae forma ad odore aromatico. vid Almag. Bot. 247'].

Com.: There are six specimens on this page, one of them identified as *Mentha* cf. *piperita* L., the other five apparently of a different species.

113. Det.: *Mentha longifolia* (L.) Huds.

Herb.: HS 96: 187 ['*Mentastri spiculi folio longiore candicau- lis species major ex Insula Canarina*'].

114. Det.: *Mentha* cf. *spicata* L.

Herb.: HS 96: 189 ['*Mentha affigio inodora ex Insula Mad- era*'].

115. Det.: \* *Pericallis tussilaginis* (L'Hér.) D. Don.

Herb.: HS 95: 128 ['*Cacalia Africana floribus Jacobea pur- pureis ex insula Canarina*'].

116. Det.: *Salvia* cf. *verbenaca* L.

Herb.: HS 96: 100 ['An Hormino Canariensis'].

117. Det.: *Sisymbrium* cf. *erysimoides* Desf.

Herb.: HS 96: 18 ['An Eruca Gomerensis'].

118. Det.: \* *Stachys germanica* L. var. *canariensis*  
Font Quer & Svent.

Herb.: HS 98: 69 ['Stachys Canariensis [crossed] Verbasci folio Canariensis'].

119. Det.: *Umbilicus* cf. *horizontalis* (Guss.) DC.

Herb.: HS 95: 200 ['Cotyledon s. Umbilicus radici tuberosa minor ex Insul. Canar.'].  
Com.: This specimen does not belong to any known species from the Canary Island flora.

120. Herb.: HS 89: 68 ['Filicula Canarina elegans'].

Com.: This specimen does not belong to any known species from the Canary Island flora.

121. Herb.: HS 96: 14 ['Elegans Salvia [illeg.] Canariensibus Dicta'].

Com.: There is no specimen for this label.

122. Herb.: HS 98: 95 ['An Thymelea from I. Canaries'].

Com.: The specimen situated close to this label does not belong to any species from the Canary Island flora. However there is another specimen on this page belonging to *Daphne gnidium* L. to which this label could refer.

## DISCUSSION

With almost 125 plant entries, both Plukenet's herbarium and his publications can be regarded as the most important pre-Linnaean account of the Macaronesian flora. The majority of species recorded by this herbalist are the earliest known references to the plants of this flora. Plukenet's descriptions of Canarian plants pre-date those of Feuillée (Feuillée, 1724) which has been traditionally considered as the most complete pre-Linnaean work for the Canarian flora (Herrera-Piqué, 1987). Although it was published later than Plukenet's work, the approximately 20 species illustrated by this French naturalist are also extremely important as they were the first known field drawings of Canarian plants made by any European scientist who visited the archipelago (Herrera-Piqué, 1987).

In this study we have demonstrated that from Plukenet's works and collections, the seventeenth century herbalist clearly had available a considerable amount of information on the Macaronesian flora. However, subsequent taxonomic reviews of the region have made hardly any mention of them. Linnaeus himself referred to only 24 of these phrase-names and in his own copies of Plukenet's publications there are few annotations for the Macaronesian species.

Other important works published shortly after Linnaeus (e.g. Linnaeus filius, 1782; Aiton, 1789; L'Héritier,

1785–1805) do not quote any of Plukenet's names despite having had access to his publications, and they were based on the exhaustive plant collections made in the Azores, Canaries and Madeira between 1776 and 1779 by the collector from Kew, Francis Masson (Lemmon, 1968). Only L'Héritier (1788) mentioned Plukenet's polynomial *Mentha canariensis frutescens, foliis* [ . . . ] *foliorum longiribus pediculis insidentibus* (entry 73) as a synonym of *Bystropogon canariense* (L.) L'Hér.

More recent publications restricted to the Macaronesian flora have followed the same pattern. For instance, there are only two mentions of Plukenet's names in the Flora of the Canary Islands produced by Pitard & Proust (1908) whereas in Lowe's Floras of Madeira (Lowe, 1838, 1857–1872) we have found no reference to any of his polynomials. However, the Canarian naturalist Viera y Clavijo (1866–1869) mentioned, in his *Diccionario de historia natural de las Islas Canarias*, twelve of the Plukenet names previously cited as synonyms by Linnaeus. This poor utilization of Plukenet's publications by researchers of the Macaronesian flora may well be due to the fact that his works have no geographical index, and as E. L. Greene reported on the *Almagestum* ' . . . in this kind of book, you are helpless to even begin to search, unless you have some idea of the genus, or a genus, to which it [a plant] may belong . . . ' (Greene, 1983).

It was only in the middle of the nineteenth century that Webb & Berthelot in their *Histoire naturelle des Iles Canaries* (Webb & Berthelot, 1836–1850) cited 27 of Plukenet's phrase-names in the synonymy of some of the taxa described in their work. Some of these names were not previously treated by Linnaeus (e.g. *Ilex perado* Aiton ssp. *platyphylla* (Webb & Berth.) Tutin for entry 12, *Chamaecytisus proliferus* (L. f.) Link for entry 29, *Arbutus canariensis* Veill. for entry 18). Furthermore, Webb & Berthelot also looked critically at Linnaeus' treatment of Plukenet's Macaronesian names. For instance they found that the polynomial *Cytisus Canariensis, microphyllus, angustifolius, prorsus incanis* [ . . . ] *Esta Insulanis nuncupatur* (entry 30) had been incorrectly synonymized with *Genista canariensis* L. by Linnaeus.

Further studies will be needed in order to establish the taxonomic identity of earlier phrase-names given as synonyms by Plukenet. However, many of them were associated with plant species from regions other than Macaronesia. Among them there are taxa from the New World (e.g. Marggraf, 1648; Hernández, 1651; Ogilvy, 1671; Plumier, 1693), the Far East (Rheede tot Draakenstein, 1689, 1690) and the Middle East (Rauwolf, 1707). It is very doubtful whether these names have any real taxonomic relationship with those Macaronesian taxa described by Plukenet. Indeed we could identify what appear to be 'good' synonyms for only seven of his descriptions (i.e. entries 14, 37, 61, 66, 78, 96 and 97). Although Plukenet's publications have been regarded as containing one of the most comprehensive reviews of names from the ancient herbalists (Pulteney, 1790) it seems that there were many errors in these synonyms. This was noticed by John Ray, who in one of his letters to Hans Sloane stated ' . . . I have gotten a sight of Dr. Plukenet's 'Almagestum bot' [ . . . ] As far as I am able to judge, he is often out in his conjectural synonymes . . . ' (Henrey, 1975).

In contrast, Plukenet's illustrations of Macaronesian plants (a selection of which are shown amongst Figs. 3–15) are remarkable. Although it seems that they were not drawn by Plukenet himself but by various other artists, the most important of them being M. van der Gucht (Henrey, 1975),



they reveal the skill and observational abilities of Plukenet as a botanist. This is clearly shown in the drawing of *Solanum vespertilio* Aiton (Fig. 13 and entry 94). This endemic from Tenerife and Gran Canaria is one of the few *Solanum* species which has flowers with one of the stamens longer than the others and the style curved and elongated (Jaeger & Hepper, 1986). This means that flower buds of this species have a small peak towards their ends. The character is clearly illustrated in Plukenet's drawing, making its identification as *S. vespertilio* unmistakable.

Most of his references and collections appear to have been based on material brought to Britain by visitors who stayed in Macaronesia. It is well known that a strong trade in orchil, pitch, sugar, wine and cloth was established between the Canary Islands and Britain during the sixteenth and seventeenth centuries (Morales-Lescano, 1973; Fernández-Armesto, 1982; Lobo-Cabrera, 1988). This led to the foundation of trading companies such as the 'Canary Company' in 1655 (Morales-Lescano, 1965a). Furthermore, other European visitors visited the islands during this period in order to study their natural history (e.g. T. Sprat from the Royal Society in Tenerife in 1667 (Morales-Lescano, 1965b), John Cuninghame in La Palma and Hans Sloane in Madeira in the late seventeenth century (Dandy, 1958)). It is therefore likely that many of Plukenet's references which concern the Macaronesian region reflect the trading and scientific links which existed between Britain and the islands during this time. Being in close association with the Royal gardens and with the most important British herbalists, Plukenet could have had easy access to most of the exotic plant material which was introduced into Britain during the second half of the seventeenth century.

The collections and works of Leonard Plukenet provide a valuable source of information on early accounts of non-European floras, as already shown for the West Indies (Howard, 1979). However, it is likely that many of his references and specimens came originally from sources which were European in a broad sense. Plukenet's studies in the Macaronesian region provide a good indication of what knowledge was had by European naturalists and herbalists half a century before Linnaeus (1753) published what we now accept as the first valid binomial names for Macaronesian plants.

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Abbreviations for Botanic Gardens and for publications as they are cited in Plukenet's works are given below. Full identification of these abbreviations can be found in the list of References. Those abbreviations which were not identified are indicated by '[?]'. Plant entry numbers are also given for each abbreviation.

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# Studies on the lichen genus *Sticta* (Schreber) Ach.: II. Typification of taxa from Swartz's *Prodromus* of 1788

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**SYNOPSIS.** Of the 18 lichens described from Jamaica by Swartz in his *Prodromus* (1788), three taxa are referable to the genus *Sticta*, viz. *Lichen damaecornis*, *L. laciniatus* and *L. tomentosus*, although Swartz's *L. laciniatus* is a later homonym of *L. laciniatus* Hudson (1762) and is illegitimate. *Lichen damaecornis* and *L. tomentosus* are typified from authentic Swartz material and detailed descriptions and taxonomic notes are given. Swartz material distributed as *L. laciniatus* comprises two distinct taxa which are newly described here as *Sticta laciniosa* and *S. swartzii*.

## INTRODUCTION

*Sticta* is a widely distributed lichen genus of some 60 species with a preponderance of taxa found in tropical or subtropical areas, especially the Caribbean, Central America and the tropical parts of South America, and the palaeotropics from Africa and the Indian Ocean Islands to the Pacific. Apart from the cosmopolitan taxa *S. fuliginosa* (isidiate) and *S. limbata* (sorediate), found on all major land areas, and the widespread palaeotropical species *S. sublimbata* and *S. wiegelii*, species of *Sticta* tend to have rather restricted distributions with both tropical and temperate regions having well-defined endemic taxa, for example New Zealand (Galloway, 1985), East Africa (Swinscow & Krog, 1988), Juan Fernandez and southern South America (Galloway, 1994). Species of *Sticta* and *Lobaria* (unlike *Pseudocyphellaria*) are particularly strongly represented in the neotropics in comparison with numbers of taxa in cool temperate parts of South America (Galloway & Arvidsson, 1990; Galloway, 1994). This reflects a basic biogeographical distinction between these three important Southern Hemisphere genera with *Pseudocyphellaria* having pronounced austral affinities (Galloway, 1987, 1988a, 1992b) while both *Sticta* and *Lobaria* appear to be predominantly tropical groups (Galloway & Arvidsson, 1990). Species of *Sticta* are now recognized as being important nitrogen producers in both tropical and temperate forest ecosystems (Green et al., 1980; Galloway, 1988a, 1992a, 1992b, 1994). Nitrogen is fixed by cyanobacteria present either as primary photobionts or as internal cephalodia (James & Henssen, 1976). The taxonomy of *Sticta* is still very confused, especially in tropical regions where speciation in the genus is most marked. A number of early names in the genus, for example *Sticta damaecornis*, have been widely used in the tropics, when it is now known that several entities are involved. In order to clarify correct use of names in *Sticta*, the present paper is one in a series attempting to define the limits of taxa described in the late eighteenth century and early nineteenth century.

The Swedish botanist Olof Peter Swartz (1760–1818) was a student of Linnaeus's son, Carl Linnaeus, completing his studies in medicine and natural history at the University of

Uppsala in 1783. Twenty-two years old, and furnished with ample private means, he was keen to travel to distant parts to study natural history in the tradition of the elder Linnaeus's 'Linnaean apostles' (Stafleu, 1971). Swartz decided on the West Indies as a suitable area for study, following in the footsteps of Sir Hans Sloane, Charles Plumier, Patrick Browne and Nicolaus Joseph Jacquin (Stearn, 1980). Choosing the island of Jamaica, he embarked from Sweden on 5 August 1783, and landed at Montego Bay in Jamaica on 5 January 1784 after some time botanizing at Boston, Massachusetts. During his time in Jamaica he collected widely from the interior of the island and reached the highest summits in the Blue Mountains (Stearn, 1980). On his return home in 1786 he spent some time in London working on the arrangement and naming of his West Indian collections with the help of Sir Joseph Banks's herbarium and library and with the assistance of Jonas Dryander, Banks's Swedish librarian. The first results of Swartz's West Indian botanical collections appeared in his book *Nova genera et species plantarum seu Prodromus* (Swartz, 1788), a slim but nomenclaturally very important work (Stearn, 1980; Nicolson & Jarvis, 1990).

Some of the earliest names now recognized in *Sticta* appear in Swartz's *Prodromus* where he described 18 new taxa in the collective genus *Lichen* (see Galloway, 1981, 1988b), of which *L. damaecornis* and *L. tomentosus* are referable to *Sticta* as *S. damaecornis* (Sw.) Ach. and *S. tomentosa* (Sw.) Ach. Subsequently, these taxa and the illegitimate *Sticta laciniata* (Sw.) Ach., were widely, and often incorrectly, reported in the literature on tropical lichens. In an attempt to clarify the confusion which exists in the literature relating to present distributions of these taxa, they are typified on authentic Swartz material from Jamaica, descriptions are given and bibliographic and taxonomic notes are supplied for each. Original Swartz material distributed as *Lichen laciniatus* Sw. comprises two distinct taxa; one with a green algal photobiont which is newly described here as *Sticta laciniosa* D.J.Galloway, and one with a cyanobacterial photobiont, which is newly described as *S. swartzii* D.J.Galloway.

Authentic Swartz material from Jamaica and reported in the *Prodromus* was studied from the following herbaria: BM, BM-ACH, G, GB, L, PC-MONTAGNE, SBT, UPS, UPS-ACH, UPS-THUNBERG. More recent material from

Jamaica and from neotropical and palaeotropical regions was studied from BM collections.

Scanning electron microscopy was performed on air-dried material coated with gold-palladium on aluminium stubs, using an Hitachi S-800 microscope. Thin-layer chromatography of acetone extracts was carried out according to standardized methods (Culberson, 1972; White & James, 1985).

## SYSTEMATIC TREATMENT

1. *Sticta damaecornis* Ach., *Meth. Lich.*: 276 (1803). *Lichen damaecornis* Sw., *Prodr.*: 146 (1788). *Platisma cornudamae* Hoffm., *Descr. Adumbr. pl. lich.* **1**: 103, tab.

XXIV, figs 1–7 (1790). *Parmelia damaecornis* (Sw.) Eschw. in Martius, *Fl. Bras.* **1**: 213 (1833). *Lobaria damaecornis* (Sw.) Trevisan, *Lichenotheca veneta* exs. 75 (1869). Type: Jamaica, sine loco, Swartz (SBT – lectotype selected here).

Figs 1, 2.

*Sticta damaecornis* f. *elongato-laciniata* Tuck. in Stizenb., *Flora, Jena* **81**: 121 (1895). [Wright, *Lichenes Cubae* No. 59]; nom. nud.

*Thallus* 4–8(–10) cm diam., possibly larger, irregularly spreading, loosely attached, margins free,  $\pm$  ascending. Lobes rather narrow, (1.5–)2–4(–7) mm wide,  $\pm$  regularly dichotomously branching, divergent at apices, discrete, con-

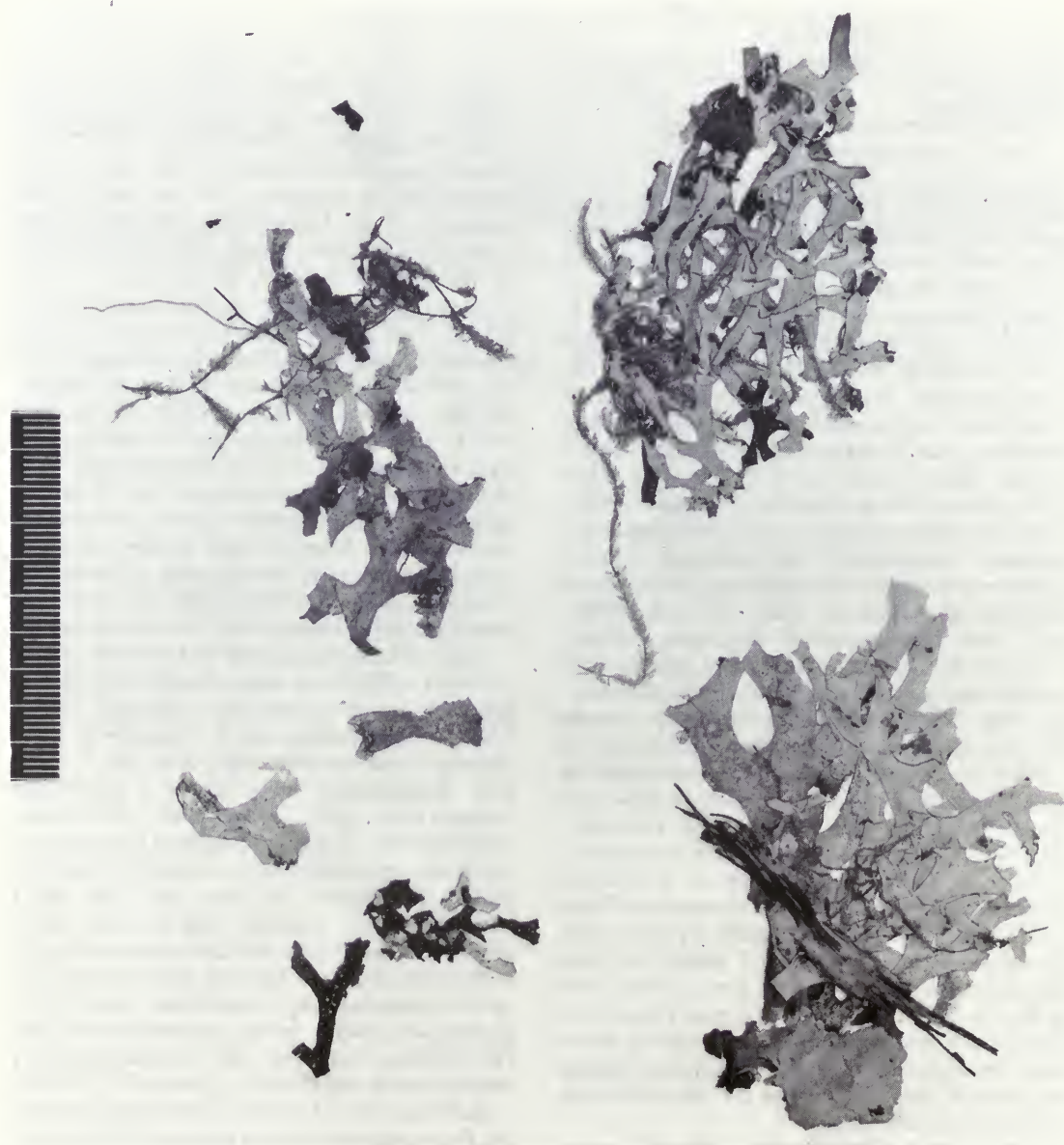


Fig. 1 *Lichen damaecornis* Sw. Lectotype (SBT). Scale in mm.





Fig. 2 Hoffmann's 1794 illustration of *Platismia cornudamae*. Scale in mm.

liguous to somewhat entangled centrally, plane to distinctly convex, often markedly canaliculate below, apices blunt, rounded or shallowly furcate. *Margins* entire, conspicuously thickened and ridged below, sinuses smoothly rounded. *Upper surface* olivaceous, suffused brown or red-brown at apices when wet, pale green-grey to olivaceous or buff, suffused brownish when dry, matt, somewhat coriaceous, minutely punctate-impressed to irregularly dimpled in parts to  $\pm$  uniformly smooth, pliable, flabby when wet, rather brittle when dry, minutely maculate ( $\times 10$  lens), maculae visible as a faint, irregular white marbling of upper surface. Isidia, phyllidia, pseudocyphellae, and soredia absent,  $\pm$  continuous under SEM or with occasional, scattered pores (Fig. 3A). *Medulla* white, K-. *Lower surface* white or pale tan to dark brown or brown-black, smooth to irregularly wrinkled-ridged,  $\pm$  glabrous or glabrous only near apices to  $\pm$  tomentose from apices to centre, tomentum sparse to moderate, pale buff to brown-black, silky to felted-entangled. *Cyphellae* common, scattered, conspicuous, rounded, regular, rather small, 0.3(–0.5) mm diam., margins sharply defined, conspicuously raised above lower cortex and tomentum, basal membrane white (Fig. 4A). *Thallus* 120–200(–240)  $\mu\text{m}$  thick. *Upper cortex* 20–30  $\mu\text{m}$  thick, outermost 8–10  $\mu\text{m}$  pale yellow-brown, of small, closely compacted cells 2–5  $\mu\text{m}$  diam., inner zone colourless, of larger, thin-walled, round to irregular cells 6–8.5  $\mu\text{m}$  diam. *Photobiont layer* dense, continuous, 25–35  $\mu\text{m}$  thick, photobiont green, cells rounded, densely packed, to 4  $\mu\text{m}$  diam. *Medulla* 55–145  $\mu\text{m}$  thick, of loosely interwoven colourless hyphae, 4–5  $\mu\text{m}$  diam. *Lower cortex* 20–30  $\mu\text{m}$  thick, closely similar in structure to upper cortex, outermost layer of cells pale red-brown. *Tomental hairs* pale red-brown to yellow-brown, to 5.5  $\mu\text{m}$  diam., and 60–170  $\mu\text{m}$  long (Fig. 5A).

*Apothecia* common, marginal or submarginal, rounded, 0.5–1.5 mm diam., subpedicellate, constricted at base, pedicel 0.2–0.6 mm thick, disc matt, epruinose, shallowly concave at first, soon becoming plane to subconvex, disc pale to dark red-brown or  $\pm$  blackened, margins persistent, roughened, paler than disc, exciple below disc pale buff to dark brownish, roughened to areolate-scabrid, sometimes with silky whitish to red-brown tomentum. *Exciple* 112–190  $\mu\text{m}$  thick, pale to dark red-brown, of parallel, radiating, round to oblong, thick-walled cells 8.5–15  $\mu\text{m}$  diam. *Hypothecium* 55–90  $\mu\text{m}$  thick dark greenish- or olive-brown, turning olive-black in K and suffusing a distinctive yellow pigment into thecium and surrounding mounting medium. *Thecium* 60–70  $\mu\text{m}$  tall, pale yellow-brown, becoming pale yellowish to pale pinkish in K; *epithecium* 14–20  $\mu\text{m}$  thick, dark brown or red-brown, intensely granular, pale red-brown in K; paraphyses simple, 2.5–3  $\mu\text{m}$  thick, apices swollen. *Asci* cylindrical 70–82(–88)  $\times$  14–17(–20)  $\mu\text{m}$ . *Ascospores* ellipsoid with pointed ends, pale olive-brown to  $\pm$  colourless, 1–3-septate, 25–30.5  $\times$  5.5–8.5  $\mu\text{m}$ .

CHEMISTRY. Nil.

DISTRIBUTION. Jamaica, Cuba (Imshaug, 1957). Palaeotropical and South American material referred to this name (e.g. Nylander, 1860; Stizenberger, 1895; Zahlbruckner, 1925) belong in other taxa, for example *Sticta dichotoma* for narrow-lobed species from Indian Ocean islands, and *S. ainoae* (Galloway & Pickering, 1990) for collections from temperate, southern South America.

TYPE. Original (syntype) Swartz material of *Lichen damaecornis* is found in the following herbaria: BM-ACH (Galloway, 1988b), BM, G, GB, H-ACH (Vainio, 1915), PC-MONTAGNE, SBT, UPS- THUNBERG [sheet 26188]. Material from Swartz's herbarium (SBT sheet 40, Fig. 1) is selected as lectotype. This agrees with the original description and the early fine coloured illustration (Hoffmann, 1794: tab. 24, fig. 7) showing the morphological characters which correctly define this West Indian species (Fig. 2).

OBSERVATIONS. Early accounts of *Sticta damaecornis* (Hoffmann, 1794; Acharius, 1799, 1803, 1810, 1814) follow Swartz (1788, 1811) in giving the West Indies as habitat for the species, and Acharius (1814) included two varieties, *wiegeli* and *canariensis*, which are today referred to the species *Sticta wiegelii* (Acharius) Vainio and *S. canariensis* (Flörke) Delise. The former occurs widely in both tropical and temperate habitats (Galloway, 1994), the latter in Macaronesia, Spain, Portugal, France, Great Britain, Ireland and Norway (Purvis et al., 1992). Hooker (1822) recorded it from the neotropics, while Delise (1825) cited it from America, Jamaica and Réunion and described a similar though distinct species, *S. dichotoma* Delise, from Mauritius and Réunion. Fée (1837) recognized *S. damaecornis* as being distinct from Delise's *S. dichotoma* while in contrast, Nylander (1860), who recorded *S. damaecornis* as a widespread tropical species, recognized several varieties viz., var. *sinuosa*, var. *macrophylla*, var. *caperata* and var. *dichotoma*. Tuckerman (1882) like Nylander, also had a wide and obviously heterogeneous concept of the species, including in it Swartz's *Lichen lacinia*-tus.

A more restricted distribution for *S. damaecornis* is accepted here (see above) with other tropical and temperate taxa being referred to other taxa (see Galloway & Pickering, 1990). *Sticta damaecornis* is characterized by rather narrow,  $\pm$  regularly dichotomously branching lobes which are divergent at the apices, noticeably thickened-ridged at the margins below and commonly distinctly canaliculate below. It has a white medulla; a green photobiont; sparse to moderate tomentum on the lower surface which may be pale buff to brown-black; conspicuous, scattered, small cyphellae with sharply defined margins projecting above the tomentum; apothecia are marginal or submarginal, the disc red-brown to black, the exciple roughened to areolate-scabrid and sometimes whitish tomentose.

SPECIMENS EXAMINED. **Jamaica:** sine loco, Mr Wiles (BM); Ibid., Hart, June 1886 (BM); Mt Diablo, H.N. Ridley (BM); steep ridge on flanks of Blue Mountains in headwaters of Mabess River, 1460 m, 16 December 1988, P.J. Bellingham 1/13: 863600 (BM) [epiphytic at c. 1 m on stem of *Smilax balbisiana* under tall forest canopy]; Grand Ridge of the Blue Mountains E. of John Crow Peak, 1600 m, 8 January 1989, P.J. Bellingham 1/13: 856600 (BM) [on a fallen rotten branch Mull Ridge forest]; Grand Ridge of the Blue Mountains between Morce's Gap and John Crow Peak, 1600 m, 10 February 1989, P.J. Bellingham 1/13: s.n. (BM) [from the trunk of *Haenianthus incrassatus* at 2 m height in montane rainforest]; immediately N. of the Grand Ridge of the Blue Mountains between John Crow Peak and Morce's Gap, 1580 m, 23 March 1989, P.J. Bellingham 1/13: 856601 (BM) [epiphytic at 1.5 m on trunk of *Eugenia virgultosa* in montane rainforest]; steep ridge flanks at headwaters of Mabess River, NW of Belle Vue Peak on the Grand Ridge of the Blue



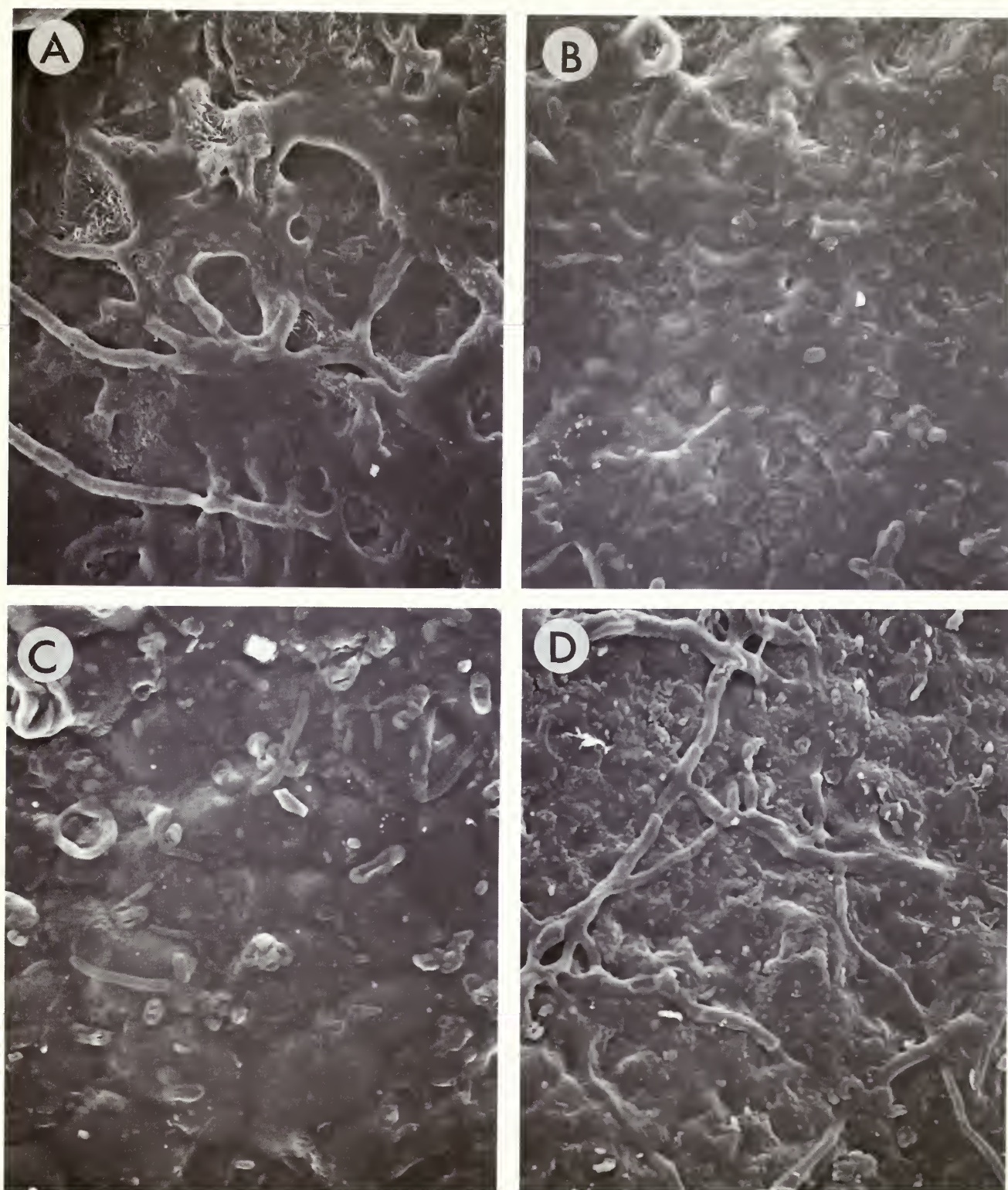


Fig. 3 SEM of upper cortex. A. *S. damaecornis* (SBT). B. *S. laciniosa* (BM). C. *S. swartzii* (BM). D. *S. tomentosa* (SBT). All  $\times 2000$ .

Mountains, 1710 m, 13 June 1990, *P.J. Bellingham* 1/13: 867597 (BM) [epiphytic at 0.3 m on trunk of *Clethra occidentalis* in montane rainforest]; steep ridge flanks at headwaters of Mabess River N. of the Grand Ridge of the Blue Mountains between Morce's Gap and John Crow Peak, 1440 m, 23

August 1990, *P.J. Bellingham* 1/13: 857602 (BM) [on the stem of a large *Marcgravia brownei* at 0.5 m under tall montane rainforest on steep, bluffed slopes]; Portland, near Hardwar Gap, near the Portland-St Andrew Line, 17–27 December 1968, *W.L. & C.F. Culberson* 13,299 [A. Vezda, *Lich. Sel-*



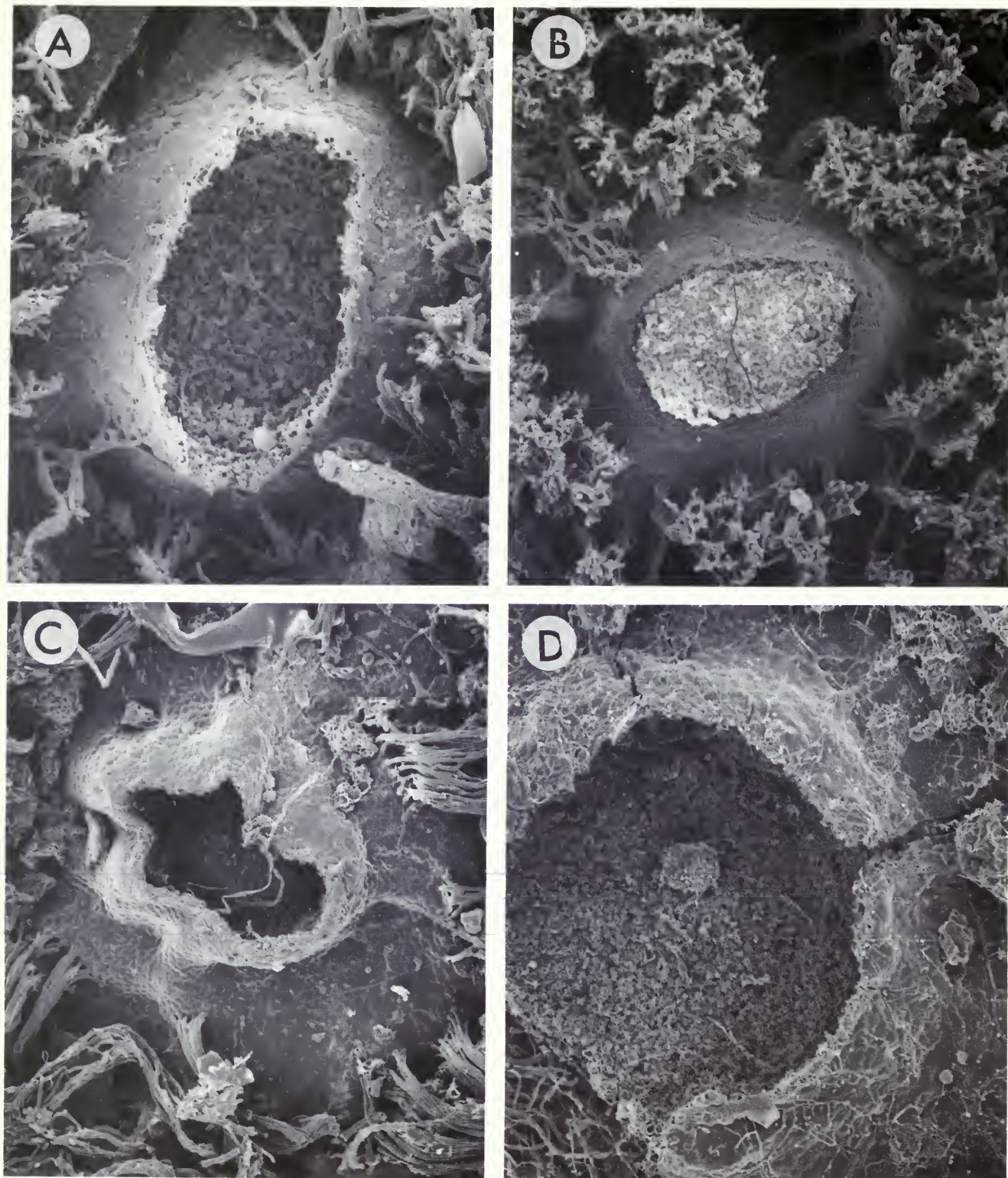


Fig. 4 SEM of cyphellae. A. *S. damaecornis* (SBT)  $\times 150$ . B. *S. laciniosa* (BM)  $\times 250$ . C. *S. swartzii* (BM)  $\times 250$ . D. *S. tomentosa* (SBT)  $\times 150$ .

.Exs. 863] (BM); Portland, Abraham's Ridge, 2000–3000 ft, 17 December 1973, B.D. Morley & C. Whitefoord 588 (BM). Cuba: sine loco, Wright 59, 60, 61 [*Lichenes Cubae*] (BM); Sierra Maestra, cerca Pico Bayamesa, S. del poblado Pino

del Agua, 1440 m, 1 December 1978, T. Pocs 9067 (BM); Sierra Maestra, Estribo de Turquino, 1600–1700 m, 20 April 1979, T. Pocs 9092 (BM); Sierra Maestra, 1300 m, 20 April 1979, T. Pocs 9087 (BM); Sierra de la Gran Piedra, Pico



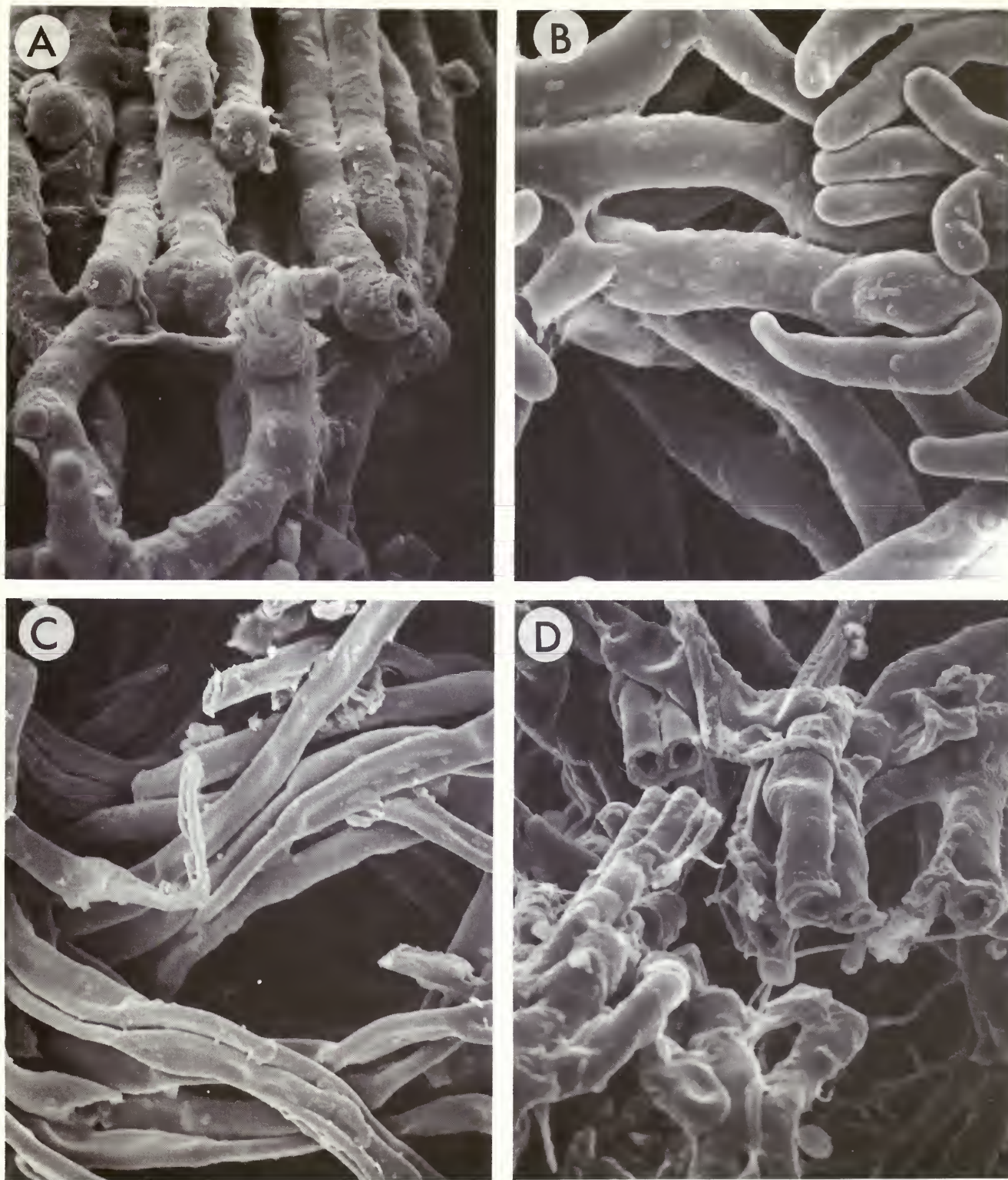


Fig. 5 SEM of tomental hairs. A. *S. damaecornis* (SBT)  $\times 2000$ . B. *S. laciniosa* (BM)  $\times 2000$ . C. *S. swartzii* (BM)  $\times 1500$ . D. *S. tomentosa* (SBT)  $\times 2000$ .

Mogota, 900–1000 m, 26 May 1979, T. Pocs 9123 [A. Vezda, *Lich.Sel.Exs.* 1680] (BM).

2. *Sticta laciniosa* D.J.Galloway, sp. nov.

Thallus viridis vel olivaceus foliaceus, laciniosus 5–8(–15) cm latus, lacinii irregulariter divisa subdichotomae vel truncatae, (2–)5–15(–30) mm latae, margis integerrimis, supra laevigatae non faveolatae; medulla niveis vel dilute stramineis,



K + rubra; subtus dense tomentosus, cyphellis numerosis profunde excavatis; apothecia 0.5–3(–6) mm lata, marginalia et aliquando supra lacinias, excipulo scabrido; sporae 8: nae, dilute olivaceus, 1–3-septatae, (22–)25–33(–36) × 5.5–8.5 µm.

Typus: Jamaica, Parish of Portland, Grand Ridge of the Blue Mountains between John Crow Peak and Morce's Gap, 18°05'N 76°39'W, c. 1610 m, on the trunk of a *Lyonia octandra* (Sw.) Griseb., (Ericaceae) at 0.5 m height in montane rainforest, 2 April 1989, P.J. Bellingham (BM-holotype). Fig. 6.

*Lichen laciniatus* Sw., *Prodr.*: 147 (1788) nom. illegit. (Art. 64.1) [Note 1]. *Platism laciniatum* (Sw.) Hoffm., *Descript. Adumbr. pl. lich.* 3: 14 (1801). nomen sed non planta. *Sticta laciniata* (Sw.) Ach., *Meth. Lich.*: 279 (1803). *Lobaria laciniata* (Sw.) Trevisan, *Lichenotheca veneta* exs. 75 (1869). [Note 2]. Type: Jamaica, sine loco, Swartz (SBT-lectotype selected here).

NOTE 1. *Sticta laciniata* Ach.

*Lichen laciniatus* (Swartz, 1788) on which Acharius's *Sticta laciniata* is based is a later homonym of *Lichen laciniatus* Hudson (Hudson, 1762: 449) and is accordingly illegitimate (Art. 64.1). Material of *Lichen laciniatus* in Swartz's herbarium (SBT) comprises two taxa, a green photobiont species with entire margins and a K+ red medullary reaction, which is here described as *Sticta laciniosa*, and a cyanobacterial photobiont species, with delicately phyllidiate margins which is described below as *S. swartzii*. Material of this latter taxon was discussed and figured by Hoffmann (1801) as *Platism laciniata* (Sw.) Hoffm., based on the illegitimate *L. laciniatus* Sw.

NOTE 2. *Lobaria laciniata* (Sw.) Trevisan

Hudson's *Lichen laciniatus* (Hudson, 1762: 449) is an earlier,

but largely forgotten, name for Scopoli's *Lichen amplissimus* (Scopoli, 1772: 386), the basionym for the well-known lichen *Lobaria amplissima* (Scop.) Forssell, and is cited as a synonym of *Lobaria amplissima* in several treatments (e.g. Crombie, 1894; Zahlbruckner, 1925). Vainio (1899) recognized this when he made the combination *Lobaria laciniata* (Hudson) Vainio, but failed to recognize that his new combination was a later homonym of *Lobaria laciniata* (Sw.) Trevisan (Trevisan, 1869) and therefore illegitimate. Thus, Hudson's *Lichen laciniatus* becomes unavailable for use in *Lobaria* and does not take precedence over *Lobaria amplissima*.

*Thallus* irregularly spreading, 5–8(–15) cm diam., loosely to closely attached from margins to centre. *Lobes* broadly laciniate, subdichotomously to irregularly branched, branches ± discrete and somewhat truncate at margins, becoming subimbricate centrally (2–)5–15(–30) mm wide, thick, coriaceous. *Margins* entire, unevenly sinuate or ± truncate, slightly thickened below, occasionally to ± commonly furnished with projecting, short black tufts of tomentum. *Upper surface* lettuce green to olive green, occasionally suffused brownish at margins when wet, pale olivaceous or pale glaucous-greyish or yellowish or ± brownish in parts when dry, mainly plane or subconvex to minutely, irregularly and shallowly pitted or wrinkled, not faveolate or punctate-impressed, matt, without isidia, maculae, phyllidia, pseudocyphellae or soredia, ± continuous under SEM, rarely with occasional, scattered pores (Fig. 3B). *Medulla* whitish to pale yellowish, K+ red. *Lower surface* smooth or minutely wrinkled especially at margins, pale brown at margins, black centrally or black and shining from margins to centre in older lobes, glabrous in a narrow, marginal zone, ± uniformly densely tomentose from margins to centre, except for young lobe tips, tomentum dark brown to black, thick, entangled, shaggy or woolly. *Cyphellae* common, scattered, round or



Fig. 6 *Sticta laciniosa*. Holotype (BM). Scale in mm.



subirregular, 0.1–0.5(–1.2) mm diam., deeply excavate, often sunk in dark tomentum, margins thin, sharply defined (Fig. 4B), concolorous with lower cortex, pit membrane yellowish to pale ochre. *Thallus* 200–450(–550)  $\mu\text{m}$  thick. *Upper cortex* 40–55  $\mu\text{m}$  thick, colourless, of round to irregular  $\pm$  isodiametric cells, 2.5–8.5  $\mu\text{m}$  diam. *Photobiont layer* 40–55  $\mu\text{m}$  thick, photobiont green, cells rounded, 3.5–5.5  $\mu\text{m}$  diam. *Medulla* 150–300  $\mu\text{m}$  thick, colourless in upper parts, pale red-brown near lower cortex, hyphae loosely interwoven to 5.5  $\mu\text{m}$  diam. *Lower cortex* 40–65  $\mu\text{m}$  thick, dark red-brown, cells round to irregular, thick-walled, 2.5–11  $\mu\text{m}$  diam. *Tomental hairs* 5–8.5  $\mu\text{m}$  diam., dark red-brown to 180  $\mu\text{m}$  long, in clustered fascicles (Fig. 5B).

*Apothecia* prominent, mainly marginal and submarginal, occasionally laminal, 0.5–3(–6) mm diam., subpedicellate, round to subirregular, concave at first becoming plane or subconvex at maturity, disc orange-brown to dark red-brown,

rarely  $\pm$  blackened, glossy especially when young, epruinose, smooth to matt and minutely roughened-papillate at maturity. *Proper exciple* swollen, conspicuous, persistent,  $\pm$  obscuring disc when young, slightly darker than disc, conspicuously verrucose-areolate, margins slightly raised above surface of disc, without projecting marginal hairs. *Exciple* 150–230  $\mu\text{m}$  thick, pale red-brown in outer parts,  $\pm$  colourless internally, of parallel, radiating, round to irregular thick-walled cells 8–22  $\mu\text{m}$  diam. *Hypothecium* 50–65  $\mu\text{m}$  thick, densely interwoven, olive brownish to red-brown, unchanged in K. *Thecium* 160–200  $\mu\text{m}$  tall, pale yellow-brown to dark brown; epithecium 14–20  $\mu\text{m}$  thick, dark brownish to red-brown, unchanged in K; paraphyses simple, 2–3  $\mu\text{m}$  thick, apices swollen to 5  $\mu\text{m}$  diam. *Asci* cylindrical to clavate-cylindrical (80–)88–106  $\times$  16–19.5  $\mu\text{m}$ . *Ascospores* elongate-ellipsoid, apices pointed, pale olive-brown, 1–3-septate, (22–)25–33(–36)  $\times$  5.5–8.5  $\mu\text{m}$ . *Pycnidia* common,

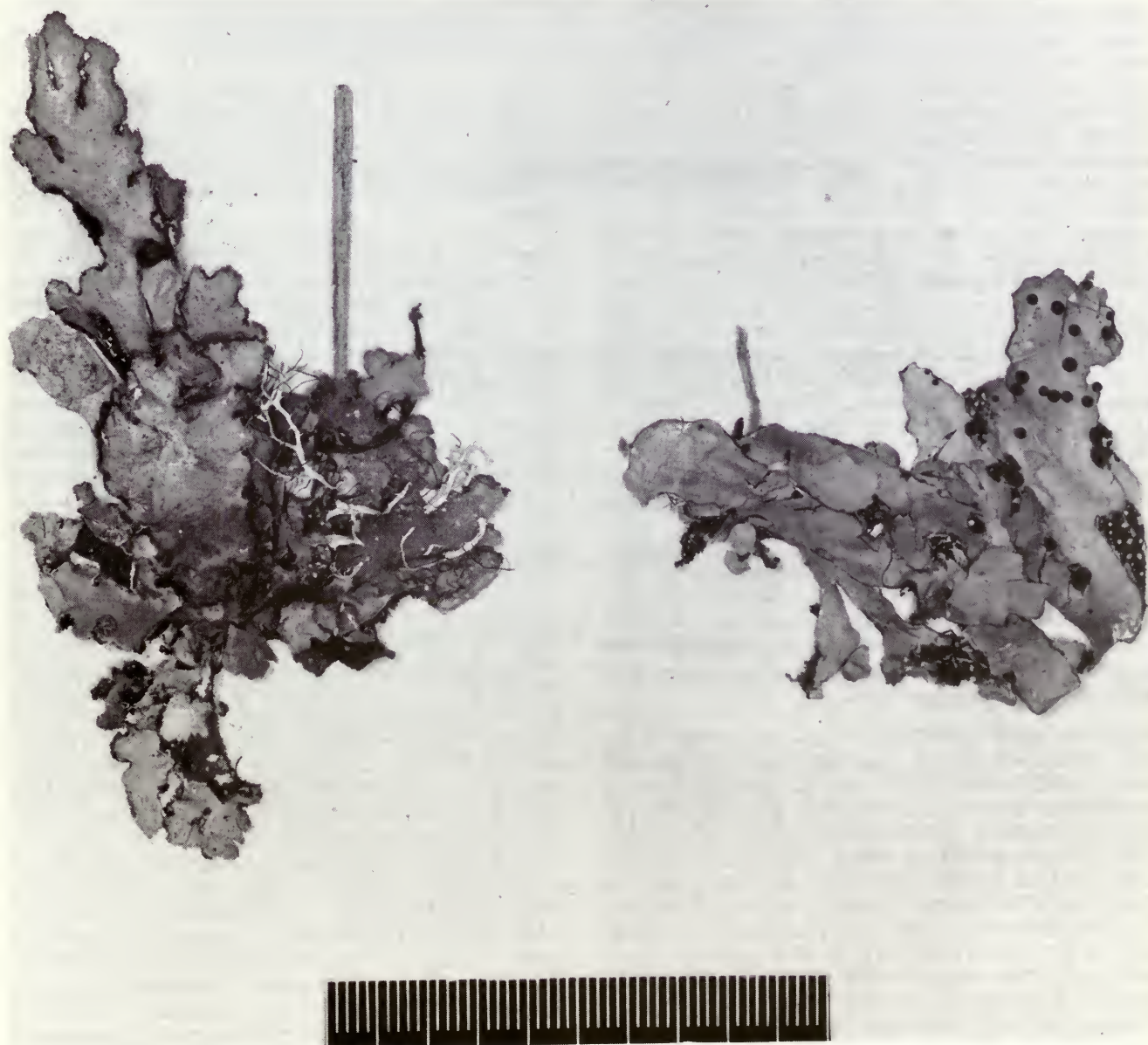


Fig. 7 *Lichen laciniatus* Sw. Lectotype, right-hand specimen (SBT); left-hand specimen is *S. swartzii*. Scale in mm.

scattered, often crowded, ostiole punctate, 0.1 mm diam., dark brown-black, often with noticeably swollen margin concolorous with thallus.

**CHEMISTRY.** Medulla K+ red: containing a complex mixture of terpenoids, pigments and other lichen substances separated by TLC. The presence of acetone-soluble secondary compounds is extremely unusual in species of *Sticta*, although gyrophoric acid, congryophoric acid and an unidentified, fast-running compound (Rf class 7) are known from the Asian species *S. nylanderiana* Zahlbr., *S. platyphylloides* Nyl. (lacking gyrophoric acid) and *S. praetextata* (Räsänen) Awasthi (Joshi & Awasthi, 1982; Chen, 1993). The above chemical pattern in *S. laciniosa* is presently under investigation.

**DISTRIBUTION.** Jamaica (all records seen except one); also in Colombia (one nineteenth century collection only, no recently collected material was seen).

**OBSERVATIONS.** Original material of *Lichen laciniatus* Sw. is found in the following herbaria: H-ACH (Vainio, 1915), SBT, UPS-ACH [S.L. 232], UPS, UPS-THUNBERG (sheet 26193 pr.p.). Material from Swartz's herbarium in Stockholm (SBT sheet 38, right-hand specimen, Fig. 7) is selected as lectotype since it accords with the original description, the illustration published by Swartz (1811: pl. 7) and with the most recent correct usages of the name (Malme, 1899; Vainio, 1915) which refer to the characteristic K+ red reaction of the medulla. As is mentioned above, the name *Sticta laciniata* (Sw.) Ach. is illegitimate and cannot now be used for this characteristic species which is accordingly here described as *S. laciniosa*. The left-hand specimen in SBT sheet 38 is a different species of *Sticta* having a cyanobacterial photobiont, and delicate coralloid, marginal isidia. This taxon was illustrated in Hoffmann (1801: tab. LXV, 3) and material of it is present also in GB as *Lichen laciniatus* (Arvidsson, 1989). This taxon is described below as *S. swartzii*.

*Sticta laciniosa* is characterized by lacinate, somewhat truncate lobes rather variable in width with entire margins and having a green photobiont, a mainly smooth upper surface which is not faveolate or punctate impressed, a white to very pale yellowish medulla (K + red), prominent, marginal and laminal ascomata, a thickly tomentose lower surface, the brown-black tomentum often projecting beyond the lobe margins, and scattered, deeply excavate cyphellae sunk in the tomentum and having sharply defined, thin margins and a pigmented basal membrane.

**SPECIMENS EXAMINED.** **Jamaica:** sine loco, *Purdie* (BM); *Ibid.*, *Mr Wiles* (BM); *Ibid.*, June 1886, *Hart* (BM); immediately N. of the Grand Ridge of the Blue Mountains between Morce's Gap and John Crow Peak, on steep slopes at the head of the Mabess River catchment, 1580 m, 14 January 1989, *P.J. Bellingham* 1/13: 856601 (BM) [common over a small damp, shaded rock face under montane rainforest]; Grand Ridge of the Blue Mountains between John Crow Peak and Morce's Gap, 1600 m, 3 February 1989, *P.J. Bellingham* 1/13: 855600 (BM) [on trunk of *Hedyosmum arborescens* at 1.5 m height, under predominantly *Clethra occidentalis* canopy]; Grand Ridge of the Blue Mountains between John Crow Peak and Morce's Gap, 1600 m, 10 February 1989, *P.J. Bellingham* 1/13: s.n. (BM) [from trunk of *Haenianthus incrassatus* at 1 m height, in montane rainfor-

est; from trunk of *Hedyosmum arborescens* at 2 m height, in montane rainforest]; Grand Ridge of the Blue Mountains between John Crow Peak and Morce's Gap, 1610 m, 2 April 1989, *P.J. Bellingham* 1/13: 854602 (BM) [on trunk of *Lyonia octandra* at 0.5 m height in montane rainforest]; immediately S. of the summit of Blue Mountain Peak, 2240 m, 4 September 1990, *P.J. Bellingham* 1/18: 945549 (BM) [on trunk of *Vaccinium meridionale* at 1 m height in elfin forest. **Colombia:** [as N. Granada] sine loco, *Mrs Blagbourne* (BM).

### 3. *Sticta swartzii* D.J. Galloway, sp. nov.

Thallus cinereus foliaceus, laciniosus, 4–7.5(–10) cm latus; lacinii irregulariter divisa, 2–5(–10) mm latae, margis isidiatis vel phyllidiatis vel ciliatis; supra nitida, laevigatae vel faveolatae; medulla niveis K–; photobion Nostocaceis; subtus tomentosus, margine glabrae, cyphellae profunde excavatae; apothecia 0.5–1.0(–1.5) mm lata, marginalia et aliquando supra lacinias, excipulo pallido, minute scabrido; sporae 8: nae, incolores, 1–3-septatae, ellipsoideae, apices acutae, (28–)33–36 (–42) × 8.5–12(–14) µm.

Typus: Jamaica, Parish of St Andrew, Grand Ridge of the Blue Mountains, west of the summit of St John Peak, 18°05'N 76°39'W, c. 1910 m, epiphytic at 0.5 m on the trunk of *Eugenia alpina* (Sw.) Willd. (Myrtaceae) in upper montane rainforest, 29 April 1990, *P.J. Bellingham* (BM-holotype). Fig. 8.

*Thallus* 4–7.5(–10) cm diam., irregularly spreading or clustered in partial rosettes, loosely attached centrally, margins ± free. Lobes irregularly lacinate, 2–5(–10) mm wide, subdividomously to irregularly branched, ± free, discrete at margins, entangled-imbriate centrally, rather thin and papery, fragile. *Margins* slightly thickened and delicately ridged below, entire in parts and then with ± prominent whitish to black or brown projecting cilia, 0.2–0.5 mm long, to ragged, lacerate-isidiate-phyllidiate. *Upper surface* dark slate blue or blue-black when wet, pale to dark grey, here and there suffused red-brown or brown when dry, mainly plane or subconvex, matt or shining, smooth in places or irregularly shallowly ridged, occasionally dimpled to ± regularly punctate-impressed towards margins, isidiate, maculate, phyllidiate, without soredia or pseudocyphellae, ± continuous under SEM (Fig. 3C). *Maculae* minute, white, (use × 10 lens), with scattered larger photobiont-free areas appearing as irregular pale buff to whitish blotches. *Isidia* marginal, 0.5–2 mm tall, terete, fingerlike to ± coralloid, becoming flattened-phyllidiate. *Phyllidia* marginal, 0.5–2 mm tall, constricted at base, dorsiventral, ± lanceolate at first to ragged-subcoralloid, best developed in older parts of thallus. *Medulla* white, K–. *Lower surface* minutely and irregularly wrinkled at margins, ridged to ± faveolate centrally, pale whitish or greyish at margins to buff or brown centrally, ± tomentose, tomentum rather variable, from thin and ± arachnoid to thick and woolly, often well-developed centrally with margins ± glabrous, or ± continuous from margins to centre, pale buff to dark brown. *Cyphellae* scattered, round, rarely elongate, 0.1–0.5(–1.00) mm diam., deeply excavate, margins very thin, sharply defined, concolorous with lower surface, basal membrane white or creamish, not pigmented (Fig. 4C). *Thallus* 55–135(–170) µm thick. *Upper cortex* 20–30(–35) µm thick, colourless, of 3–4 rows of round to irregular, thick-walled cells, 5.5–16 µm diam., cells close to



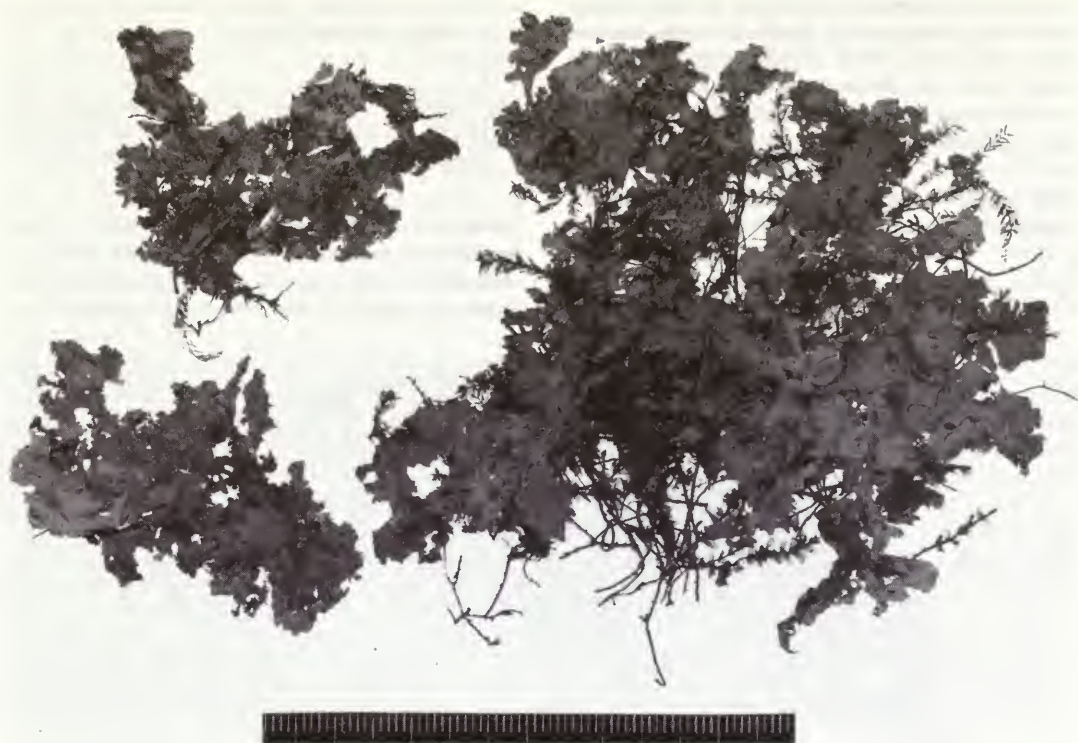


Fig. 8 *Sticta swartzii*. Holotype (BM). Scale in mm.

photobiont layer much larger than cells of outermost layer. *Photobiont* layer 20–45  $\mu\text{m}$  thick, dense, continuous, photobiont ?*Nostoc*, cells rounded, 5.5–9  $\mu\text{m}$  diam., clustered in packets. *Medulla* 35–70  $\mu\text{m}$  thick, almost lacking in young lobes, hyphae colourless, loosely interwoven, 3–5  $\mu\text{m}$  diam. *Lower cortex* 14–25  $\mu\text{m}$  thick, colourless, 1–2 rows of round to irregular, thick-walled cells 5.5–22  $\mu\text{m}$  diam. Tomental hairs 5.5–8.5  $\mu\text{m}$  diam., colourless, to 170  $\mu\text{m}$  long, single or in fascicles (Fig. 5C).

*Apothecia* rather rare, marginal or submarginal, 0.5–1.0(–1.5) mm diam., subpedicellate, constricted at base, round, very shallowly concave at first soon becoming plane, disc red-brown to dark brown, epruinose, matt, slightly roughened. *Proper exciple* pale pinkish brown, markedly paler than disc,  $\pm$  translucent when wet, minutely corrugate-scabrid, without projecting marginal hairs. *Exciple* 110–225  $\mu\text{m}$  thick, pale red-brown in outermost 15–20  $\mu\text{m}$ , remainder colourless, of parallel, radiating, round to irregular, thick-walled cells, 11–28  $\mu\text{m}$  diam., largest diameter cells towards hypothecium. *Hypothecium* 55–115  $\mu\text{m}$  thick, opaque, upper 20–35  $\mu\text{m}$  red-brown, paler in K, remainder colourless. *Thecium* 135–170  $\mu\text{m}$  tall, colourless; *epithecium* 10–17  $\mu\text{m}$  thick, red-brown, paler in K,  $\pm$  contiguous with hypothecium at margins of fruit; paraphyses simple, 2–3  $\mu\text{m}$  thick, swollen to 5  $\mu\text{m}$  at apices. *Asci* clavate-cylindrical 70–110  $\times$  16–25  $\mu\text{m}$ . *Ascospores* elongate-ellipsoid, apices pointed, colourless, 1–3-septate, (28–)30–36(–42)  $\times$  8.5–12(–14)  $\mu\text{m}$ . *Pycnidia* not seen.

CHEMISTRY. TLC nil.

DISTRIBUTION. Jamaica.

OBSERVATIONS. Original Swartz material from Jamaica hav-

ing a cyanobacterial photobiont, delicate marginal coralloid isidia and a K– medulla and labelled *Lichen laciniatus* is found in the following herbaria: GB, UPS-THUNBERG (sheet 26193 pr.p.). This taxon was also illustrated in Hoffmann (1801: tab. LXV, 3). As indicated above (see under discussion of *S. laciniosa*) this is a good independent taxon which is here described as *S. swartzii*.

*Sticta swartzii* is characterized by rather narrow, irregularly laciniate, thin, papery lobes with coralloid isidiate to phyllidiate margins and often fine, projecting cilia. It has a shining upper surface which is irregularly punctate-impressed; a white medulla which is K–; occasional, small, marginal or submarginal apothecia with prominent pale, glabrous margins; and a variably tomentose lower surface with scattered, round, deeply excavate cyphellae with a white or creamish basal membrane.

SPECIMENS EXAMINED. **Jamaica:** sine loco, Swartz (GB, UPS-THUNBERG 26193 pr.p.); headwaters catchment of the Mabess River, N. of the Grand Ridge of the Blue Mountains, Parish of Portland, c. 1480 m, 1 May 1989, P.J. Bellingham 1/13: 858601 (BM) [Occasional on a shaded rock face (shale) on a steep ridge under montane rainforest]; Grand Ridge of the Blue Mountains W. of the summit of Sir John Peak, Parish of St Andrew, c. 1910 m, 29 April 1990, P.J. Bellingham 1/13: 877603 (BM) [On the trunk of *Cyrtilla racemiflora* in upper montane rainforest]; Grand Ridge of the Blue Mountains immediately W. of Belle Vue Peak, Parish of St Andrew, c. 1740 m, 12 May 1990, P.J. Bellingham 1/13: 867597 (BM) [Epiphytic at 1 m on the trunk of *Cyathea pubescens* in montane rainforest]; NE flanks of Sir John Peak, at a small headwater gully of the Spanish River, Parish of Portland, c. 1840 m, 9 September 1990, P.J. Bellingham 1/13: 88160 (BM) [Epiphytic at 1 m height on the trunk of a

*Cyathea pubescens* in deep shade at the head of a moist gully in montane rainforest]; steep ridge flanks at headwaters of the Green River, W. of High Peak, Parish of St Thomas, c. 1780 m, 18 May 1991, *P.J. Bellingham* 1/13: 885594 (BM) [Epiphytic at 0.5 m height on the trunk of *Podocarpus urbanii* in tall montane rainforest].

4. *Sticta tomentosa* (Sw.) Ach., *Meth. Lich.*: 279 (1803). *Lichen tomentosus* Sw., *Prodr.*: 147 (1788). *Lobaria tomentosa* (Sw.) Räscher, *Nomenclat. Bot.* ed 3: 330 (1797). *Stictina tomentosa* (Sw.) Nyl., *Syn. meth. lich.* 1(2): 343 (1860). *Dystictina tomentosa* (Sw.) Clem., *Gen.*

*fung.*: 175 (1909). Type: Jamaica, sine loco, Swartz (SBT-lectotype selected here).

Fig. 9.

*Sticta bicolor* Taylor in *Lond. J. Bot.* 6: 183 (1847). Type: Brazil, Organ Mountains, [near summit, March 1841], Gardner 1001 (BM-lectotype selected here).

*Thallus* 10–50(–85) mm diam., orbicular,  $\pm$  rosette-forming, loosely attached centrally, margins free. *Lobes* rather broad, rounded, 5–10(–20) mm diam.,  $\pm$  discrete at margins or shallowly imbricate, shallowly or occasionally deeply incised,

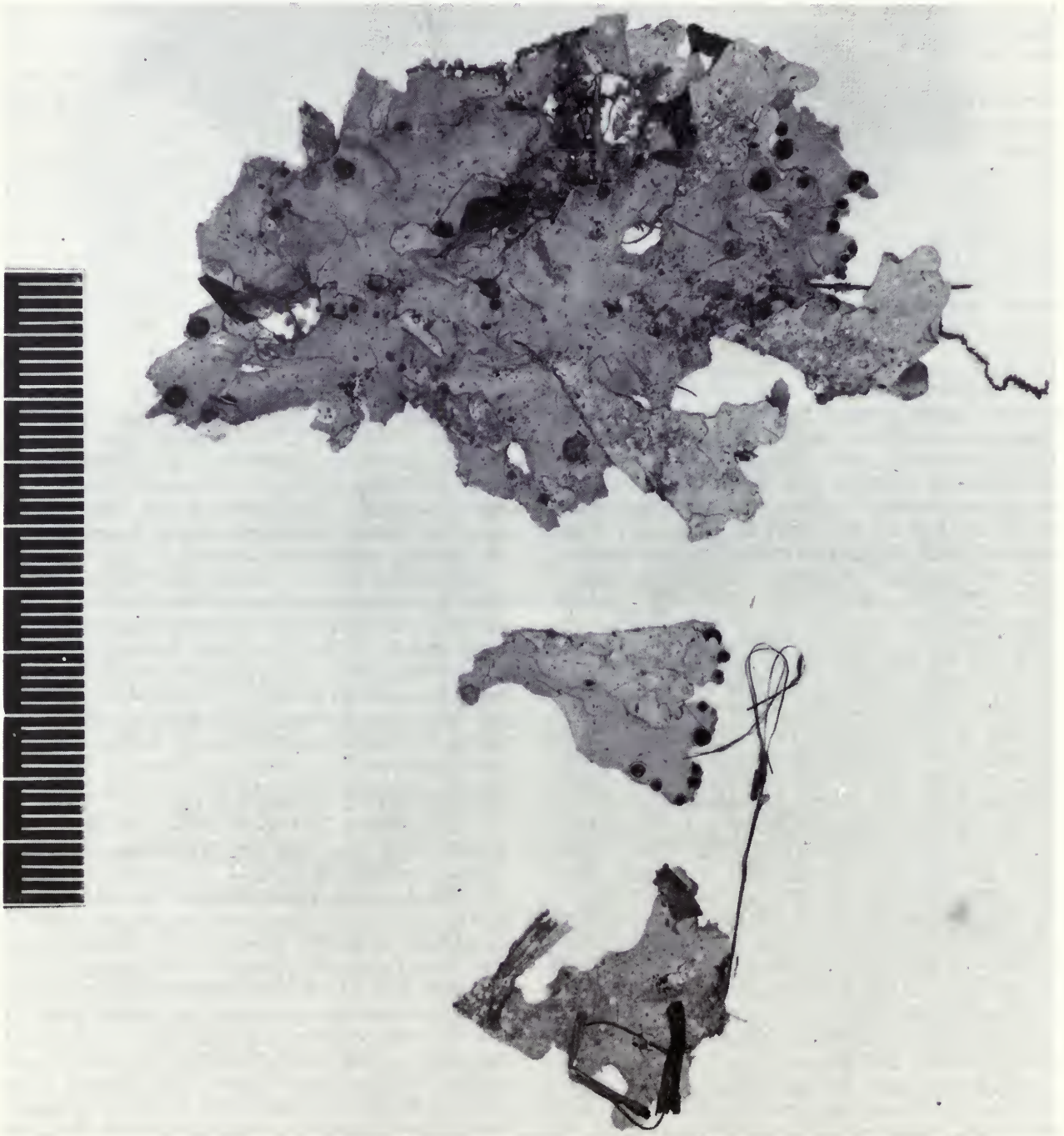


Fig. 9 *Lichen tomentosus* Sw. Lectotype (SBT). Scale in mm.



rarely from margins to centre. *Margins* entire, not thickened below, wavy, slightly crisped and subascendent above, occasionally to  $\pm$  commonly with minute, silky, white, glistening, projecting tufts of tomentum. *Upper surface* dark blue-black or glaucous blue-grey when wet, pale blue-grey when dry, smooth, undulate, occasionally but erratically punctate-impressed, matt or rarely glossy in parts, never velvety-pilose, tomentose or scabrid, rather thin and papery in texture, brittle when dry, flabby, pliable when wet, maculate, without isidia, pseudocyphellae or soredia,  $\pm$  continuous under SEM or with occasional scattered pores (Fig. 3D). *Maculae* white, minute, scattered ( $\times 10$  lens). *Medulla* white, K-. *Lower surface* white at margins, pale tan to brownish centrally,  $\pm$  glabrous in a wide marginal zone, matt, minutely wrinkled, tomentum white, rarely pale brownish centrally, silky, sparse to  $\pm$  densely felted. *Cyphellae* common, scattered, round to subirregular, 0.1–0.8(–1.5) mm diam., margins very narrow, sharply defined, rising abruptly and  $\pm$  vertically from lower surface (Fig. 4D), central cavity white, deeply concave. *Thallus* 140–225  $\mu$ m thick. *Upper cortex* 14–20  $\mu$ m thick, colourless, of two layers of thick-walled cells, wall 2.5–3  $\mu$ m thick, uppermost layer of smaller cells 2.5–5  $\mu$ m diam., inner cells larger, 8.5–12  $\mu$ m diam. Photobiont layer continuous, 40–55  $\mu$ m thick, photobiont cyanobacterial ?*Nostoc*, cells in clusters in a colourless gelatinous matrix, cells 3–5.5  $\mu$ m diam. *Medulla* 70–130  $\mu$ m thick, of loosely woven, colourless hyphae to 4  $\mu$ m diam. *Lower cortex* a single layer of thick-walled, rectangular, colourless cells, 14–20  $\mu$ m tall and 8–11  $\mu$ m thick, wall to 3  $\mu$ m thick. *Tomental hairs* colourless, single or in clusters, to 4  $\mu$ m diam., 35–135  $\mu$ m long (Fig. 5D).

*Apothecia* common, richly developed and often clustered at margins, rare or absent centrally, rounded, sessile, constricted at base to very shortly pedicellate, insertion of disc showing a marked concavity on lower surface, 0.1–1.5(–2) mm diam., disc plane to subconvex, matt, pale to dark red-brown when dry, epruinose, pale brown,  $\pm$  opaque when wet. *Proper exciple* persistent when dry, excluded when wet, white to pale buff or creamish, smooth to minutely crenulate with occasional projecting silky white hairs at margins of disc, especially noticeable in young fruits. *Exciple* 55–125  $\mu$ m thick, outermost 30  $\mu$ m dilute yellow-brown, remainder colourless, of round to irregular,  $\pm$  isodiametric cells 8–22  $\mu$ m diam. *Hypothecium* 40–55  $\mu$ m thick, densely interwoven, upper 22–28  $\mu$ m pale red-brown, remainder colourless, unchanged in K. *Thecium* 80–90  $\mu$ m tall, colourless; *epithecium* 5–9(–13)  $\mu$ m thick, pale olive-brown to red-brown, unchanged in K; paraphyses distinctly septate, constricted at septa and appearing long-moniliform, 3.5–8  $\mu$ m diam., swollen and tinged olive-brown at apices. *Asci* cylindrical, (72–)80–92  $\times$  11–17  $\mu$ m. *Ascospores* colourless, long-ellipsoid, apices pointed, straight or curved, 3-septate, 27.5–33.5(–36)  $\times$  5.5–8.5  $\mu$ m.

CHEMISTRY. Nil.

DISTRIBUTION. Neotropics and palaeotropics. Jamaica (Imshaug, 1957), Mexico (Imshaug, 1956b), Panama (Imshaug 1956a), Colombia, Venezuela, Peru, Brazil (Malme, 1934). East Africa including Kenya, Tanzania, Uganda (Swinscow & Krog, 1988), St Helena (Leighton, 1871), South Africa, Madagascar, Hawaii (Magnusson & Zahlbruckner, 1943; Magnusson, 1956).

TIPIFICATION. Original (syntype) Swartz material of *Lichen tomentosus* is found in the following herbaria: G, GB, L [910,213–1824], SBT, UPS, UPS-THUNBERG [sheet 26202]. Material from Swartz's own herbarium (SBT sheet 44) is selected as lectotype (Fig. 9) since it accords with the original description and closely resembles the coloured illustration later provided by Swartz (1811: pl. IX). Material in BM-ACH labelled *Sticta tomentosa* by Acharius (Galloway, 1988b) is a mixture of two taxa neither of which appears to be *Sticta tomentosa*.

OBSERVATIONS. In commenting on his species *Sticta bicolor*, Thomas Taylor (1847) gives the following notes which are a good description of the morphology of *S. tomentosa*: '...Thallus 4 inches wide, lobes scarcely one quarter of an inch broad, the central parts of an ash-grey, the extreme of a chestnut brown, but little deepened by moisture. The thick dark grey scabrous pubescence of the inferior surface of the thallus reappears on the backs of the apothecia. The smooth surface of the thallus and the crowded marginal sessile apothecia readily distinguish this species from *S. sylvatica* Ach.'

SPECIMENS EXAMINED. **Jamaica:** sine loco, *Mr Wiles* (BM); sine loco, on branches and twigs of trees, Feb.–March 1905, *Miss C.E. Cummings* [*Lich. Exs.*, G.K. Merrill 193] (BM); headwaters of catchment of the Mabess River, N. of the Grand Ridge of the Blue Mountains, 1340 m, 8 May 1989, *P.J. Bellingham* 1/13: 860602 (BM) [from trunk of *Myrcianthes fragrans* on a rock bluff in montane rainforest]; steep slopes at the headwaters of the Mabess River N. of the Grand Ridge of the Blue Mountains between Morce's Gap and John Crow Peak, 1420 m, 5 July 1990, *P.J. Bellingham* 1/13: 859601 (BM) [Epiphytic at 0.5 m height on stems of *Picea weddellii* in a steep rubbly channel at the edge of an old landslide]; steep ridge at headwaters of Mabess River, N. of the Grand Ridge of the Blue Mountains between Morce's Gap and John Crow Peak, 1440 m, 23 August 1990, *P.J. Bellingham* 1/13: 857602 (BM). **Mexico:** La Cima, 3050 m, 14 July 1908, *C.G. Pringle* S 19,184 (BM); Amecameca, 14 September 1908, *C.G. Pringle* S 19,225 (BM); Hills Patzcuaro, November 1891, *C.G. Pringle* S 22,511 (BM). **Panama:** Chiriqui, between Los Planes de Hornito and Fortuna Lake. Trail to Zarzo, 1200 m, 8 March 1985, *R. Hampshire* & *C. Whiteford* 335 (BM). **Colombia:** Rio Magdalena, *Mr J. Weir* (BM); Cali-Dagua Road, after Bitaco turning, 1000 m, 17 December 1967, *R.M. Garrett* 36 (BM); sine loco., ex Herb. Lindig 2521 (BM). **Venezuela:** Sierra de Sto Domingo, 1 August 1958, *R.W.G. Dennis* 1935b (BM). **Peru:** In declivibus Andium peruvianarum. pr. Sachapata, Sept. 1854, *W. Lechler* 3124 (BM). **Brazil:** Organ Mountains, *Gardner* (BM); sine loco, *Mr Weir* 61 (BM). **St Helena:** High Peak National Forest, 600 m, 17 December 1986, *A.B. Barlow* (BM). **Tanzania:** Arusha Distr., Mt Meru, south side, 2000 m, February 1974, *T.D.V. Swinscow* T16/5 (BM). **Kenya:** Meru Distr., Mt Kenya, east side, Themwe, 2100 m, February 1974, *T.D.V. Swinscow* 3K 16/8 (BM); Mt Kenya, 2 km NW of Irangi Forest Station, 2000 m, February 1974, *T.D.V. Swinscow* K48/15 (BM); Mt Kenya, near Castle Forest Station, 1900 m, February 1974, *T.D.V. Swinscow* K 49/6 (BM). **Uganda:** Kigezi District, Kinkizi County, 1600 m, December 1971, *T.D.V. Swinscow* 3U 56/4 (BM). **South Africa:** Cape Province [Kaffraria], Barziya (?), *Rev. R. Baur* (BM). **Madagascar:** sine loco, *Barron* (BM). **Hawaii:** Mauii, Puu Kukui, Mount Kaulawelewele, 295 m, 25 April 1970,

*A.C. Jermy* s.n. (BM) [on soft sandstones or as epiphytes in *Metrosideros* rainforest with *Pomantia arborea* as a dominant shrub].

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# Seaweeds of the western coast of tropical Africa and adjacent islands: a critical assessment. IV. Rhodophyta (Florideae) 4. Genera L–O

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**SYNOPSIS.** This paper assembles and, so far as is possible without extended field and herbarium studies, examines critically the validity of records of marine and brackish-water Rhodophyta (Florideae) for the western coast of tropical Africa. The whole mainland coastline from the northern boundary of Western Sahara southwards to the southern boundary of Namibia, the oceanic islands from the Salvage Islands southwards to Ascension and St Helena, and all islands close to the African mainland coast are included in the area covered. Each species entry includes all traced records for the species, the names which have previously been applied to it for the area, and additional comments or evaluation, as necessary. Comments are also provided at generic or generic group levels in very complex cases. One new recombination is made, *Nothogenia magnifica* (Pilger) J.H. Price.

## INTRODUCTION

The area dealt with in this part of the work is identical with that covered in parts published previously (Lawson & Price, 1969; Price, John & Lawson, 1978, 1986, 1988, 1992; John, Price, Maggs & Lawson, 1979). Country names employed and their earlier equivalents, and the names of island groups included, are either listed in the legend or both listed and shown on the map in Fig. 1. Genera with the initial letter L–O and constituent species are listed in alphabetical order.

Each main entry consists of:

- (i) **The major bold heading**, representing the currently-accepted name and authorities.
- (ii) **Subsidiary italicized headings at intervals within the entry**. These are in square brackets and essentially subdivide the overall entry. They represent the different ways in which the species has been referred to throughout in past publication patterns for the area. Incorrect citations from past literature have been maintained in these subsidiary heads so that there shall be no doubt as to which record we attribute to which

species or lower taxon level; only when clarification was required for comprehension have changes been made in subhead citation, in which case explanation is given in intermediary or terminal notes.

(iii) **The distributional data**, with countries and island groups arranged in a single alphabetical order. More generalized but still relevant statements of distribution follow the specific country list. Complete distribution patterns require a scan of records established under all names by which a species is known for this or adjacent areas. Hence, generalized distribution statements are included verbatim since it is not always clear for precisely which countries within the area they establish records.

References are presented in two ways:

- (a) as a numbered list (p. 80) to allow inclusion of manuscript and expedition sources, and (b) as a list of full references in alphabetical order. Numbers within parentheses after the geographical names refer to corresponding numbers in the references. References relevant only in previous parts of this series are omitted here and numbers are therefore not fully standardized between the present and past parts.

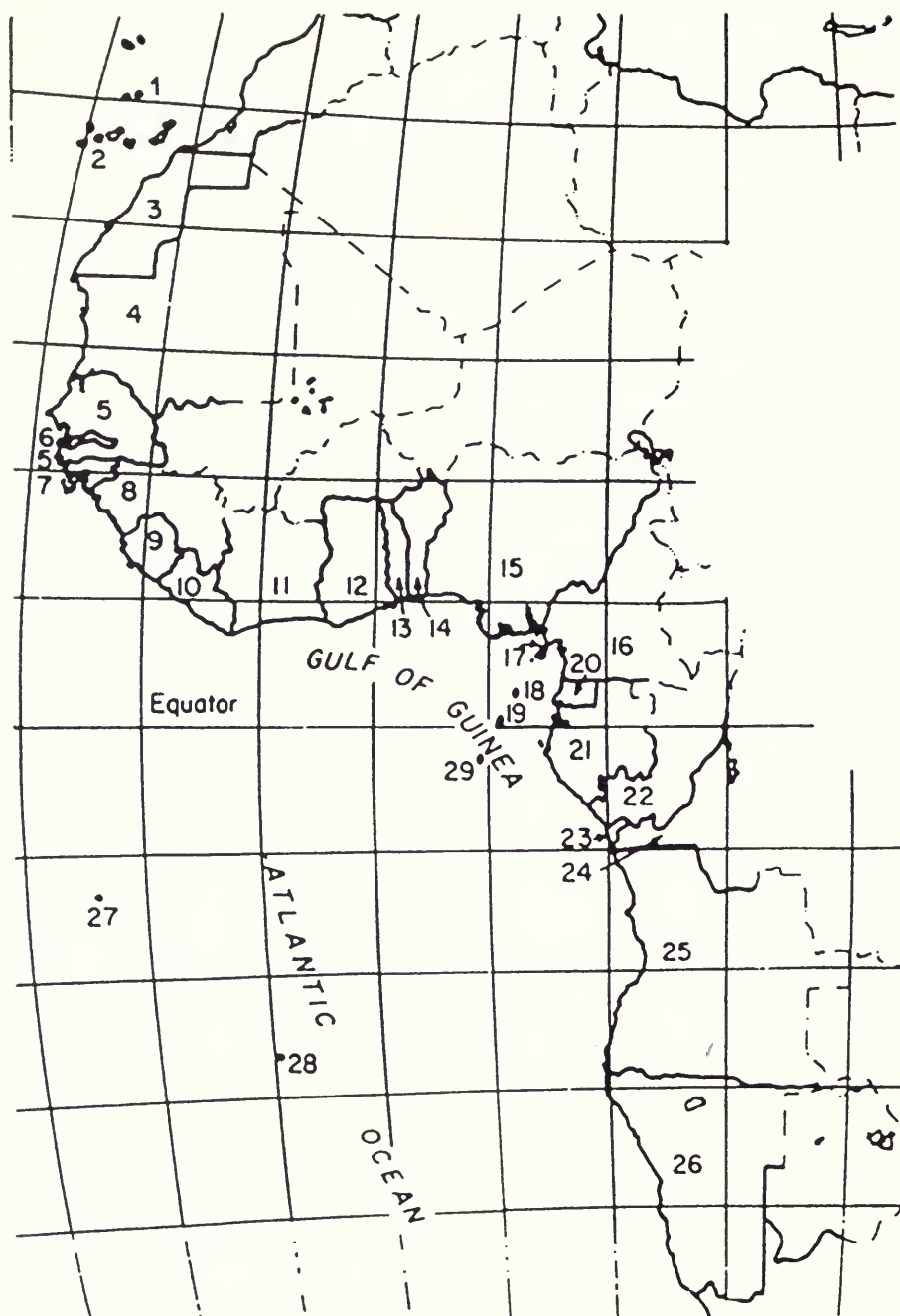


Fig. 1 The coastline of tropical West Africa and the offshore islands

1, Salvage Islands; 2, Canary Islands; 3, Western Sahara [=former Spanish Sahara, Spanish West Africa](includes the often quoted Rio de Oro, the southern region of the country, but excludes Ifni); 4, Mauritanie; 5, Sénégal; 6, Gambia; 7, Guinea-Bissau [=Portuguese Guinea]; 8, Guinée; 9, Sierra Leone; 10, Liberia; 11, Côte d'Ivoire; 12, Ghana; 13, Togo; 14, Benin [=Dahomey]; 15, Nigeria; 16, Cameroun; 17,\* Bioko [=Macias Nguema Biyogo, Fernando Pó]; 18, Príncipe; 19, São Tomé; 20,\* Equatorial Guinea [=Spanish Guinea]; 21, Gabon; 22,\*\* Republic of the Congo; 23, Cabinda; 24, Zaire [=Congo Republic]; 25, Angola; 26, Namibia [=South West Africa]; 27, Ascension Island; 28, Saint Helena; 29, Annobón [=Pagalu]. The Cape Verde Islands, which lie immediately to the west of Dakar (Sénégal), have been omitted from this map but are included in the species list that follows.

\* Nos 17 (Bioko) and 20 (Spanish Guinea, = Rio Muni) on the original map (part I) are now jointly administered as Equatorial Guinea. Bioko is entered separately, where appropriate, in the species list.

\*\* Loango, a name much used by earlier collectors such as Welwitsch, was formerly a coastal region of West Africa. Its application appears to have included much of the coastline of the Republic of the Congo (22), as well as of Cabinda (23) and Zaire (24). Because by far the longest and rockiest part of the Loango coast lies now within the Republic of the Congo we have attributed all marine algal records from Loango to the Congo.



(iv) **Additional qualifying notes** appear below whole entries or individual parts of entries to which they specifically refer. In these notes, references containing species records consist of authors' names, followed by the reference number in the terminal list and, where appropriate, the relevant page numbers after a colon. Other references consist of authors' names, date of publication and sometimes page numbers after a colon.

Species nomenclature has been revised as far as possible and the complete author citation is given for each currently-accepted combination. The subsidiary italicized headings and any other discarded combinations that require reference are included as cross-referencing entries to the currently-accepted names in the overall list. Without extended field and herbarium studies, the treatments presented here are essentially preliminary. Critical updating of the overall text is kept firmly in mind for the whole series and we would appreciate notification of any detected errors and omissions from any of the parts.

## SPECIES LIST

### *Lasiothalia* sp.

Côte d'Ivoire (288).

Liberia (129; 350; 586).

*Note.* Very tentative identification, with reservations, by Dr E. Wollaston of specimens from Harper, Cape Palmas, Liberia; not identifiable to species. A small epiphyte possibly easily overlooked or mistaken for *Callithamnion*, which it closely resembles (129). A few filaments have also been collected at nearby Tabou in Côte d'Ivoire. Probably more widespread than suggested by records.

### *Laurencia*

For a set of treatments of certain specific groups and subgeneric relationships across *Laurencia* from the western and central Pacific through the Pacific USA coasts and over to UK, see Saito (1982). Early studies by the same author exist on the genus from Japan (Saito, 1967); Hawaii, the Philippines and adjacent areas (Saito, 1969a); Pacific North America (Saito, 1969b); and southern Australia (Saito & Womersley, 1974). Saito (1982: 306) believes that '... we should not rearrange the species of *Laurencia* until the characteristics of many other species from other areas of the world have been clarified'. Work on the taxonomy of this genus in the Canary Islands, through DNA studies, is in progress (Gil-Rodríguez and others). See also the short review by Gil-Rodríguez & Haroun (658).

### *Laurencia brachyclados* Pilger

Annobón (139;350;456;457;496;535;563;586).

Ascension (475).

*Note.* Steentoft (535) commented: '... specimen of *L. brachyclados* Pilger (Mildbraed 6719 from Annobón) in Hb Børgesen would seem to represent the basal parts of a young plant of [*L. obtusa*] var. *rigidula*, but it is so minute, and at such variance with the published description (Pilger, 1920: 6) that it would seem better to leave it alone for the time being'. Mildbraed specimen 6719 bears little resemblance to Pilger's (456) description. Steentoft (535) also suggested that *L. brachyclados* might possibly be a dwarf or immature form of *L. perforata*, based solely on its description. Examination of the isotype in Herb. Agardh (No. 36616) seemed to confirm this

assertion, but Yamada (563), examining the *L. brachyclados* holotype, stated that it was not *L. perforata*. Much earlier De Toni (139: 371) had commented: 'Meâ sententia haec species videtur forsan cum *Laurencia perforata* Mont. comparanda' (This species perhaps compares with *Laurencia perforata* Mont.). Cribb (112: 166–7) considered that *L. brachyclados* and *L. pygmaea* Weber-van Bosse '... may be the same species' whereas as Pilger (456: 6) commented [*L. brachyclados*]: 'Die neue Art gehört in die Verwandtschaft van *L. scoparia* J. Ag. [q.v.]; sie ist durch ihr sprossform ausgezeichnet'.

### *Laurencia brongniartii* J. Agardh

Canaries (658).

Ghana (299;350;376;377;586;590).

'... Probably widespread in tropical seas. . .' (350;586).

'Tropical Africa (N. Gambia – Congo river)' (598).

[As *Fucus pinnatifidus* Linnaeus]

Ghana (271).

*Note.* The tentative attribution of Hornemann's (271) record given above for Ghana is explained under the entry for *Laurencia pinnatifida*, which *L. brongniartii* superficially resembles. See also entry for *Laurencia concinna* Montagne. It has been suggested by John & Lawson (590) that this species may sometimes be mistaken for *Laurencia pinnatifida* or *L. undulata* Yamada, so reports of these species from São Tomé (93) and Sénégal (122) respectively may require reinvestigation.

### *Laurencia caespitosa* Lamouroux

See *Laurencia hybrida* (DeCandolle) Lenormand ex Duby and *Laurencia canariensis* Montagne in Kützing.

### *Laurencia canariensis* Montagne in Kützing

Canaries (25;26;27;109;133;318;323;407).

'warm Atlantic. . .' (410).

[As *Laurencia caespitosa* Lamouroux]

Canaries (401; 407).

*Note.* Cotton's (109) text indicated that this is a replacement name for material that, in 1841, Montagne had considered as *Laurencia caespitosa* Lamouroux. The latter is normally considered to be a synonym, if correctly used, of *L. hybrida* (q.v.). This calls into question the status of this taxon in that records need careful analysis against *L. hybrida*. Børgesen (71: 68–69) and Dangeard (119: 182) very firmly placed *L. canariensis* Montagne in Kützing in synonymy with *L. hybrida*. In 1841 Montagne (401) had commented under his *Laurencia caespitosa* entry: '... Je doute beaucoup de la légitimité spécifique de cette Algue, que la plupart des phycologues réunissent peut-être avec raison à la précédente. Nos échantillons sont assez fidèlement représentés dans la figure citée de Gmelin.' 'la précédente' in this case was *Laurencia pinnatifida* Lamouroux. J. Agardh (25: 769; 26: 769) indicated that Montagne (401: 154) had originally considered his species as conspecific with *Laurencia hybrida* but later came to believe them to be separate. This depends on the conspecificity or separateness of *Laurencia caespitosa* and *L. hybrida*. In 1876 J. Agardh (27: 662) placed this taxon in his 'Species inquirendae'.

### *Laurencia chondrioides* Børgesen

Canaries (598;663).

[As *Chondriopsis dasyphylla* Woodward]

Canaries (439).

*Note.* The placement of *Chondriopsis dasyphylla* under *Chondria dasyphylla* in Price et al. (1986) is incorrect.

### *Laurencia complanata* (Suhr) Kützing

See notes to *Laurencia concinna* Montagne.

**Laurencia concinna** Montagne

*Note.* The question of whether *Laurencia brongniartii* J. Agardh should be recorded under that name or *L. concinna* remains open although arbitrarily decided as the former. Yamada (563) considered *Laurencia concinna* Montagne as synonymous with *Laurencia brongniartii* J. Agardh. Papenfuss (1943: 91), by contrast, considered *L. concinna* to be different from *L. brongniartii* and *L. complanata* (Suhr) Kützing. Cribb (113: 114–5) followed Yamada (563) in synonymizing the two taxa; he used the name *L. brongniartii* J. Agardh (1841) which seems to antedate *L. concinna*. Earlier, Cribb (112: 162–163) had followed Papenfuss (1943: 91) in maintaining the taxa as distinct since the type specimen of *L. brongniartii* ‘. . . is hardly complanate in the dried condition. . .’. Wynne (1986a) in his tropical/subtropical western Atlantic check-list, has accepted *L. concinna* as synonymous with *L. brongniartii*.

**Laurencia corallopsis** (Montagne) Howe

Canaries (633;658).

Cape Verde Islands (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

Salvage Islands (R.J. Haroun, in litt. 1990).

[As *L. corrallopsis* Howe]

Canaries (686).

[As *Laurencia* (grex) *corallopsis* (Montagne) Howe]

Canaries (634).

**Laurencia cruciata** Harvey

St. Helena (142;260;391;655).

*Note.* Dickie (142) regarded this species as very close to *Laurencia obtusata*, and this comment is repeated by Mellis (391) and Hemsley (260).

**Laurencia densa** (P. Dangeard) J. Feldmann

See *Chondria densa* P. Dangeard and *Laurencia microcladia* Kützing.

**Laurencia elata** (C. Agardh) Harvey

See notes to *Laurencia flexuosa* Kützing.

**Laurencia filiformis** (C. Agardh) Montagne

See note under *Laurencia scoparia* J. Agardh.

**Laurencia flexilis** Setchell

Canaries (658).

Salvage Islands (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

**Laurencia flexuosa** Kützing

[As *Laurencia flexuosa* J. Agardh]

Mauritanie (349;516).

*Note.* Jaasund (279: 62), under the name *Laurencia elata* (C. Agardh) Harvey, indicated that Yamada (563: 241, pl. 26, 27) included *L. flexuosa* Kützing and *L. luxurians* (Harvey) J. Agardh within *L. elata*, the distribution for which was cited as Australia, Tasmania and South Africa, Jaasund then adding East Africa (Tanzania).

**Laurencia galtsoffii** Howe

Gabon (294;350;586).

Ghana (288;350;586;590).

Liberia (129;288;350;586).

‘. . . in tropical parts of the Atlantic and Pacific Oceans. . .’ (350;586).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

[As *Laurencia galtsoffii* Howe]

Gabon (294).

[As *Laurencia cf. galtsoffii* Howe]

Cape Verde Islands (652).

**Laurencia hybrida** (DeCandolle) Lenormand ex Duby

Canaries (8;16;33;38B;38D;71;118;128A;191;227;229; 230; 237;263;375;489;517;598;633;634;658).

Cape Verde Islands (38B;38D;598).

Salvage Islands (38B;38D;598).

‘. . . Atlantico, desde el sur de Inglaterra a Canarias’ (517).

‘. . . Atlantique (de l’Angleterre aux Canaries). . .’ (33).

‘. . . English coast southwards to the Canary Islands. . .’ (71).

[As *Laurencia caespitosa* Lamouroux]

Canaries (3;38;44;221;254;305;401).

Cape Verde Islands (38;408;596).

‘. . . De l’Angleterre aux Canaries’ (38).

‘. . . D’Angleterre aux Canaries’ (89).

[As *Laurencia caespitosa* Lamouroux var. *subsimplex* Montagne]

Cape Verde Islands (38;408;597).

[As *Laurencia hybrida* DeCandolle forma]

Canaries (387).

*Note.* Børgeesen (71: 68–69) very firmly placed Canaries *Laurencia caespitosa* and *L. canariensis* in synonymy with *L. hybrida*. See also the entry for *Laurencia canariensis* Montagne in Kützing.

**Laurencia intermedia** Yamada

Cape Verde Islands (652;683).

Côte d’Ivoire (350;586).

Ghana (295;350;586;590;695).

Liberia (129;295;350;586).

‘. . . does not extend from the Gulf of Guinea into Senegal’ (487).

‘. . . in tropical parts of the Atlantic and Pacific Oceans’ (350;586).

‘. . . probably widespread in many warm temperate and tropical seas’ (590).

‘. . . Tropical Africa (N. Gambia – Congo river)’ (598).

[As *Laurencia papillosa* (Forsskål) Greville]

Ghana (153;338;537).

‘warm Atlantic’ (78).

*Note.* For clinal morphological variation between *L. papillosa* <—> *L. intermedia* <—> *L. paniculata*, see the notes to *L. paniculata*. *Laurencia tropica* Yamada, *L. flexilis* Setchell and (so far as treatment of some areas of the Indian Ocean are concerned) *L. intermedia* Yamada are very similar. Yamada (563: 234), quoted also in Jaasund (279: 61), commented that more specimens becoming available from different localities could well result in his *L. tropica* being reduced to synonymy with *L. flexilis* Setchell. Tanzanian plants clearly identifiable with Børgeesen’s Indian Ocean material that he described as *L. flexilis*, correspond to the detailed description provided by Saito (1967: 39–45) for *L. intermedia* Yamada. In the end, Jaasund (279: 62) remained uncertain about the conspecificity of Tanzanian (and Indian Ocean) *L. flexilis* and *L. intermedia*, whilst using the latter



name and generally being inclined to believe that only one taxon was involved.

### ***Laurencia implicata* J. Agardh**

Canaries (Leiden Herbarium, collected during trip of Helgoland Research Vessel 'Heincke').

[As *L. intricata* Lamouroux]

Cape Verde Islands (652).

São Tomé (350;535;586).

Sénégal (51;59).

?Sierra Leone (30;350;586).

' . . . in warm temperate and tropical parts of the Atlantic and Pacific Oceans. . . ' (350;586).

' . . . Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]. . . ' (598).

' . . . Tropical Africa (N. Gambia – Congo river)' (598).

*Note.* See notes to *Laurencia majuscula* and *L. obtusa*. *Laurencia implicata* (as *L. intricata*) has been sometimes considered to be a variety of *L. obtusa* (e.g. by Yamada, 563). Lawson & John (350;586) suggest that Aleem's report of this species from Sierra Leone, growing on wave exposed shores as 'tufty cushions' with *Centroceras* and *Gelidium*, may have been a misidentification for *L. tenera*. Often referred to as *L. intricata*, but the correct name is *L. implicata* according to Silva et al. (1987).

### ***Laurencia intricata* Lamouroux**

See *L. implicata* J. Agardh.

### ***Laurencia lata* Howe & Taylor**

Sénégal (59;399).

'Subtropical Africa [Senegal <—> of Gambia); Mauritania; Former W. Sahara]' (598).

*Note.* Bodard & Mollion (59) referred certain of their specimens with dorsiventral symmetry to this species.

### ***Laurencia luxurians* (Harvey) J. Agardh**

See the notes to *Laurencia flexuosa* Kützinger.

### ***Laurencia majuscula* (Harvey) Lucas**

Canaries (633;647;658;686).

Cameroun (350;586).

Cape Verde Islands (652;683).

Gabon (294;350;586).

Gambia (296;350;586).

Ghana (178;299;300;350;376;377;586;590;654;695).

' . . . Probably pantropical. . . ' (350;586).

' . . . Tropical Africa (N. Gambia – Congo river)' (598).

Mauritanie (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

Salvage Islands (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

*Note.* This plant was once (257) considered to be a variety of *Laurencia obtusa*, since the two are almost identical anatomically. Morphologically it resembles *L. implicata* but is readily separated by its palisade-like cortical cells.

### ***Laurencia microcladia* Kützinger**

Canaries (686).

Cape Verde Islands (686).

Mauritanie (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

Sénégal (54;59;529).

'Atlantique tropicale' (529).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara] (598).

'warmer parts of Atlantic Ocean' (97).

[As *L. obtusa* (Hudson) Lamouroux]

Canaries (439 pro parte).

*Note.* See the entry for *Chondria densa* P. Dangeard, where additional information is presented. Bodard (54), when referring to *L. microcladia*, placed in brackets '(= *L. densa* J. Feldmann, = *Chondria densa* Dangeard)' implying that these entities are conspecific. No further information is given to justify the implication. Prud'homme van Reine et al. (663) have re-investigated Piccone's material (439) and considered that some plants referred to him as *L. obtusa* should be more correctly attributed to *L. microcladia*.

### ***Laurencia minuta* sine auctorum**

Canaries (647).

*Note.* Cited without authority in a comparative table.

### ***Laurencia natalensis* Kylin**

See notes on *Laurencia obtusa* (Hudson) Lamouroux.

### ***Laurencia nidifica* J. Agardh**

Cape Verde Islands (652).

Côte d'Ivoire (288;350;586).

Ghana (288;350;586;590).

Liberia (129;295;350;586).

St. Helena (655).

' . . . in pluribus calidioribus oceanis formae steriles consimiles adsunt, quae an invicem specie differant parum constat. . . ' (27).

' . . . probably widespread in warm temperate and tropical seas. . . ' (350;586).

' . . . Tropical Africa (N. Gambia – Congo river). . . ' (598).

*Note.* This taxon has always presented difficulties of determination due, in part, to sparse material. Doubts recorded in many of the above references relate to that.

### ***Laurencia obtusa* (Hudson) Lamouroux**

Annobón (456;457;535).

Cameroun (337;350;535;537;586).

Canaries

(8;16;38B;38C;38D;71;128A;191;216;226;227;237;252;379;392;401;439;489;490;499;517;535;546;547;555;556;557A;584;598;633;634;647;658;662;668;684).

Cape Verde Islands

(38B;38C;38D;252;408;499;535;555;556;598).

Gambia (296;350;586).

Ghana (BM Herbarium, Foote 1949).

Mauritanie (38B;38C;38D;252;349;535;555;556).

Principe (93;350;535;586).

Salvage Islands

(38B;38C;38D;215;216;231;375;555;556;598).

São Tomé (93;251;265;350;535;586).

Sénégal (38B;38C;38D;122;529;535;542;555;556).

Sierra Leone (30;350;586).

'African and American coasts; Canary Islands. . . ' (177).

' . . . an den atlantischen Küsten von Grossbritannien bis zu den Canarischen Inseln. . . ' (501).

' . . . Atlantic coasts from Britain to the Canary Islands. . . ' (269).

‘... Atlantique (de l’Angleterre aux Canaries). . .’ (33).  
 ‘... Atlantique tropical et tempéré’ (542).  
 ‘... In mari atlantico et ejus sinibus ab ins. britannicis usque ad Brasiliam et Cap. Bon. Spei. . .’ (318).  
 ‘... in oceano atlantico . . . an ubique eadem?’ (27).  
 ‘Nordwestafrika’ (499).  
 ‘Pantropical’ (529).  
 ‘... toutes les mers chaudes. . .’ (190).  
 ‘... Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]. . .’ (598).  
 ‘... Tropical Africa (N. Gambia – Congo river). . .’ (598).  
 ‘warmer parts of Atlantic Ocean’ (375).  
 ‘Warmer parts of the Atlantic Ocean. . .’ (62;71).  
 ‘Westafrika’ (499).  
 ‘... widespread from boreal-antiboreal to tropical seas’ (350;586).  
 [As *Laurencia obtusa* Lamouroux]  
 Canaries (38;44;89;439;547).  
 Cape Verde Islands (38;145;528).  
 ‘... Atlantic [Ocean] . . . north and south . . . temperate and tropical latitudes. . .’ (254).  
 ‘... De la Grande Brétagne aux Canaries. . .’ (38;89).  
 [As *Laurencia obtusa* Hudson]  
 Cape Verde Islands (150).  
 São Tomé (263;264).  
 ‘Atlantic and Pacific, temperate and subtropical’ (143).  
 ‘Warmer parts of the Atlantic’ (144).  
 [As *Laurencia obtusa* (Hudson) Lamouroux var. *gracilis* Harvey]  
 Canaries (242).  
 [As *Laurencia obtusa* Lamouroux var. *gracilis* Kützing]  
 Canaries (439).  
 [As *Laurencia obtusa* (Hudson) Lamouroux var. *natalensis* (Kylin)]  
 São Tomé (535).  
 [As *Laurencia obtusa* (Hudson) Lamouroux var. *rigidula* Grunow]  
 Annobón (535).  
 São Tomé (535).  
 [As *Laurencia obtusa* (Hudson) Lamouroux var. *gelatinosa* Børgesen]  
 Canaries (71).  
 [As *Laurencia hybrida* (De Candolle) Lenormand ex Duby]  
 Canaries (439 pro parte).  
 Note. Prud’homme van Reine et al. (663) have re-investigated Piccone’s material (439) and considered that some plants referred to him as *L. hybrida* should more correctly be attributed to *L. obtusa*.  
 [As *Laurencia papillosa* Forsskål and var. *gracilis* Kützing]  
 Canaries (439).  
 Note. See note for *Laurencia papillosa*. [As *Laurencia* grex. [presumably ‘prox.’] *obtusa*]  
 Canaries (232B).

Note. For comment on the status of varieties sometimes recognized in *L. obtusa* and on the features distinguishing *L. obtusa*/*L. implicata* (the latter considered a variety of the former by Yamada, 563), see Lawson & John, 350: 340). See also the note under *Laurencia majuscula*. According to Steentoft (535), the São Tomé plants are close to two varieties – var. *natalensis* (Kylin) Børgesen which is more delicate, smaller, and more irregularly branched than the type, and var. *rigidula* Grunow, also smaller, more rigid, with more dense erect branches than the type. These minor differences are not a good basis for varietal recognition where morphological plasticity is high. Piccone (439: 45) indicated that he had material of this very polymorphic species that was very similar to varieties recognized under the names of *gracilis* and

*gelatinosa*. See notes under *Laurencia papillosa*, *L. brachyclados* and *L. viridis* for probable records of *L. obtusa*.

### *Laurencia paniculata* sine auctorum

See under *L. patentiramea* (Montagne) Kützing.

### *Laurencia papillosa* (C. Agardh) Greville

[As *L. papillosa* (Forsskål) Greville]  
 Ascension Island (474;475).  
 Annobón (456;457).  
 Cameroun (337;350;454;484;500;586).  
 Canaries (128A;227;584;658).  
 Cape Verde Islands (38;150;191;598;683;686).  
 Mauritanie (624).  
 ‘... in oceano Atlantico ad littora calidiora Africae. . .’ (133).  
 ‘... in oceano atlantico calidiori ad littora Africae. . .’ (26).  
 ‘... toutes les mers tropicales’ (190).  
 ‘... Tropical Africa (N. Gambia – Congo river). . .’ (598).  
 ‘Warmer parts of the Atlantic Ocean. . .’ (62).  
 [As *Laurencia papillosa* J. Agardh var. *thyrsoides*]  
 Cape Verde Islands (38).  
 [As *Laurencia papillosa* Forsskål var. *thyrsoides*]  
 Cape Verde Islands (150).  
 [As *Laurencia papillosa* (Forsskål) J. Agardh]  
 ‘... in caldiore atlantico. . .’ (27).  
 [As *Laurencia papillosa* Greville]  
 ‘Warm Atlantic’ (410).

Note. Yamada (563), who actually described *Laurencia intermedia*, regarded *L. papillosa* and *L. paniculata* as probably representing ‘... the extreme forms of one very variable species in which *L. intermedia* may be included. . .’. Piccone (439: 44–45) indicated that he had only one very small specimen from the Canaries. Børgesen reported (71: 68) that Forti had allowed him to see the small fragment, stating ‘... It was so small that I did not feel inclined to make an anatomical examination of it, but according to its appearance and colour, more reddish than *L. papillosa*, it can most probably be referred to *Laurencia obtusa*’. The Mauritanian record (624) is given with a query. See also under *L. obtusa*.

### *Laurencia patentiramea* (Montagne) Kützing

[As *L. paniculata* (C. Agardh) Kützing]  
 Canaries (38C;38D;598).  
 Cape Verde Islands (38C;38D;44;598).  
 Sénégal (37;450;451).  
 [As *Laurencia paniculata* (C. Agardh) J. Agardh]  
 Canaries (658).  
 Sénégal (529).  
 [As *Laurencia paniculata* J. Agardh]  
 Mauritanie (624).

Note. Audiffred (38C) indicated his record as new to the Canary Islands. Lawson & John (350, 586) repeated Yamada’s (563) statement of opinion that *L. patentiramea* (as *L. papillosa*) and ‘*L. paniculata* J. Agardh’ may represent ‘... the extreme forms of one very variable species in which *L. intermedia* may be included’. Askenasy (37: 47) indicated in a footnote that the specimens of *Laurencia* were very fragmentary and that Bornet, who had determined them, had given most with doubt. Given as *Laurencia paniculata*? (Agardh) Kützing by Piccone (450, 451), the Piccone (451) record was based on the Naumann (*Gazelle*) collection determined by Askenasy. See also the ‘*Laurencia* sp. A’ from Sénégal recorded by Sourie (529) and also note under *Laurencia papillosa*. For the correct name of this taxon, see Silva et al. (1987: 67, 68).



**Laurencia perforata** Montagne

See under *Laurencia tenerrima* (Clemente) Cremades & Pérez-Cirera.

**Laurencia pinnatifida** (Hudson) Lamouroux

Annobón (456).

Canaries (13;38D;226;227;229;230;232B;237;252;253;375;379;401;489;517;584;598;633;658).

Cape Verde Islands (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

?Ghana (350;586).

Mauritanie (38D;252;253;344;349;567).

Salvage Islands (38B;38D;231;375;598).

São Tomé (93;251;295;350;586;590).

Sénégal (38D;530?).

Western Sahara (38D;349).

‘. . . Atlántico Oriental (Inglaterra – Mauritania). . .’ (253).

‘. . . Atlantique (de Norvege à la Mauritanie). . .’ (33).

‘. . . Norwegen bis Mauritanien’ (567).

‘. . . widespread in boreal-antiboreal seas and less common in tropical seas. . .’ (350;586).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

‘Tropical Africa (N. Gambia – Congo River)’ (598).

[As *Laurencia pinnatifida* Lamouroux]

Canaries (44;214;268).

São Tomé (261;263).

‘. . . Atlantique depuis les côtes anglaises jusqu’en Mauritanie. . .’ (222).

‘. . . west coast of Africa. . .’ (268).

[As *Laurencia pinnatifida* (Gmelin) Lamouroux]

Annobón (457;535).

Canaries (16;42;71;191;230;236;387;392;499;535;546;556).

Mauritanie (122;529;535;556).

Salvage Islands (38B;556;556A).

São Tomé (93;535).

Sér:ég:al (529;535;556).

Western Sahara (556).

‘Afrikanischen Küste von Marokko und den atlantischen Inseln bis zum Kap’ (239).

‘. . . Faeroes southwards to the Canary Islands. . .’ (71).

‘. . . most eastern Atlantic coasts south to Sénégal’ (535).

‘Nordwestafrika’ (499).

‘Westafrika’ (499).

[As *Laurencia pinnatifida* (Turner) Lamouroux]

‘. . . De la Grande-Bretagne aux Canaries. . .’ (89).

[As *Fucus pinnatifidus* Linnaeus]

Ghana (271).

*Note.* São Tomé plants were regarded with some doubt by Lawson & John (350, 586) since dredged from 11 m; elsewhere this species is intertidal or shallow subtidal. Records are not confirmable since neither the Newton (1881) plant (see 535) nor the Carpine (93) plant (Huvé, *pers. comm.* to DMJ) are traceable. The plant superficially resembles *L. brongniartii* and might be readily mistaken for it. Sourie (529) expressed doubt, noting Dangeard’s opinion that Dakar plants approached more closely *L. undulata* (q.v.). The nomenclatural equivalence of *Fucus pinnatifidus* and *Laurencia pinnatifida* may be in error, although *L. pinnatifida* is found elsewhere in the check-list area. If drift material was involved in the original P.E. Isert collections, the flattened species *L. brongniartii*, frequent in deep waters off the Ghana coast, may have been the plant in question. The original Isert specimens, if not destroyed in the 1807 fire at Copenhagen Herbarium (C), require examination for correct attribution. This need is emphasized by the failure to re-record specimens during

the intensive work of recent decades. The record for Sénégal (530) is given with a query.

**Laurencia platycephala** Kützing

Canaries (634?;658).

**Laurencia poiteau** (Lamouroux) Howe

[As *L. papillosa* (Forsskål) Greville]

Canaries (439).

[As *L. pinnatifida* (Hudson) Lamouroux]

Canaries (439).

[As *L. poitei* (Lamouroux) Howe]

São Tomé (350;535;586).

Sénégal (59).

‘. . . probably widespread in warm temperate and tropical seas. . .’ (350;586).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

‘Tropical Africa (N. Gambia – Congo River)’ (598).

[As *Laurencia tuberculosa* Agardh]

São Tomé (251;265).

[As *Gracilaria poitei* Lamouroux]

São Tomé (251;263; 264).

[As *Gracilaria poitei* (Lamouroux) Agardh.]

São Tomé (265).

*Note.* Prud’homme van Reine et al. (663) have re-investigated Piccone’s material (439) and consider that plants referred to as *L. pinnatifida* and *L. papillosa* are correctly attributed to *L. poiteau*.

[As *L. paniculata* (C. Agardh) Kützing]

Canaries (38C;38D;598).

Cape Verde Islands (38C;38D;44;598).

Sénégal (37;450;451).

[As *Laurencia paniculata* (C. Agardh) J. Agardh]

Sénégal (529).

[As *Laurencia paniculata* J. Agardh]

Mauritanie (624).

*Note.* Audiffred (38C) indicated his record as new to the Canary Islands. Lawson & John (350, 586) repeated Yamada’s (563) statement of opinion that: ‘*L. patentiramea* (as *L. papillosa*) and ‘*L. paniculata* J. Agardh’ may represent ‘. . . the extreme forms of one very variable species in which *L. intermedia* may be included. Askenasy (37: 47) indicated in a footnote that the specimens of *Laurencia* were very fragmentary and that Bornet, who had determined them, had given most with doubt. Given as *Laurencia paniculata*? (Agardh) Kützing by Piccone (450,451); the Piccone (451) record was based on the Naumann (*Gazelle*) collection determined by Askenasy. See also the ‘*Laurencia sp. A*’ from Sénégal recorded by Sourie (529) and also note under *Laurencia papillosa*. For the correct name of this taxon, see Silva et al. (1987: 68).

**Laurencia poitei** (Lamouroux) Howe

See *L. poiteau* (Lamouroux) Howe.

**Laurencia pygmaea** Weber-van Bosse

See the notes to *Laurencia brachyclados* Pilger.

**Laurencia scoparia** J. Agardh

Sénégal (47;52;54;59).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

*Note.* Amor:gst the varied statements of name and authorities throughout Bodard & Molli:on (59), that employed in table IIID (pp.

219–220) is: '*L. scoparia* (Lamour.) Howe'. *Laurencia scoparia* sensu J. Agardh is very similar in external morphology to *L. flagellifera* J. Agardh (26: 747); the latter differs in having elongate and palisade-like epidermal layer cells and lenticular thickenings in the medulla cell walls. According to Wynne (1986a), the correct name is *L. filiformis* (C. Agardh) Montagne.

### ***Laurencia senegalensis* Bodard**

Sénégal (399).

*Note.* This is probably simply a name of convenience, carelessly allowed to pass into the publication. It seems neither to have been described anywhere in print by Bodard, nor used elsewhere by Bodard, Mollion, or anyone else.

### ***Laurencia tenera* Tseng**

Canaries (647; 658).

Cape Verde Islands (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

Côte d'Ivoire (287;295;350;586).

Gambia (296;350;586).

Ghana (288;297;350;491;586;590).

Liberia (129;287;288;350;586).

Mauritanie (Leiden Herbarium, det. M.C. Gil-Rodríguez and R.J. Haroun).

Sierra Leone (295;350;586).

St. Helena (655).

Togo (288;293;350;586;590).

'... probably pantropical. . .' (350;586;590).

'... Tropical Africa (N. Gambia – Congo River)' (598).

### ***Laurencia tenerrima* (Clemente) Cremades & Pérez-Cirera**

[As *Laurencia perforata* Montagne]

Canaries (27;38;44;89;97;128A;133;141A;323;351;390;401;407;439;563;598;662).

Cape Verde Islands (38;598).

Gabon (350; 586).

Gambia (296;350;586).

Mauritanie (624).

Salvage Islands (38B;598).

São Tomé (93;251;265;350;586).

'... in maribus caldioribus in arena et inter minores Algas repens. . .' (27).

'... Tropical Africa (N. Gambia – Congo river). . .' (598).

'... widespread in warm temperate and tropical seas' (350;586).

[As *Laurencia perforata* (Bory) Montagne]

Annobón (456).

Canaries (2;5;8;13;16;38B;38C;71;89;112;191;226;227;229;253;318;323;375;379;490;583;658;686).

Cape Verde Islands (38B;38C;100;123;183;191).

Gabon (250).

[As *Laurencia cf. perforata* (Bory) Montagne]

Cape Verde Islands (652).

Salvage Islands (38B;38C;375).

São Tomé (251;265).

'... extendida por los mares templados y tropicales. . .' (253).

[As *Laurencia perforata* (Bory) Montagne in Barker Webb & Berthelot]

Annobón (535).

Gabon (535).

Gambia (535).

São Tomé (535).

Canaries (535;633;634).

[As *Laurencia perforata* Montagne]

Canaries (25;26).

[As *Laurencia cf. perforata* (Bory) Montagne]

Cape Verde Islands (652).

*Note.* See comments concerning this species in notes under *L. brachyclados* Pilger.

### ***Laurencia tuberculosa* J. Agardh**

São Tomé (251;265).

*Note.* See *L. poiteau* and remarks of Steentoft (535). The identity of specimens clearly requires confirmation.

### ***Laurencia undulata* Yamada**

Sénégal (55;122?;529;590).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Saharal]' (598).

*Note.* Despite recording his material as *L. pinnatifida*, Sourie (529: 116) indicated Dangeard's (122) opinion that the Dakar plants approached *L. undulata* Yamada. There is also the possibility of confusion with *Laurencia brongniartii* J. Agardh (q.v.).

### ***Laurencia viridis* Gil-Rodríguez & Haroun**

Canaries (647).

Cape Verde Islands (647).

Salvage Islands (647).

*Note.* A common alga in Macaronesia, before its description usually misidentified as *L. obtusa*.

### ***Laurencia* spp.**

Cameroun (337;344;537).

Canaries (5;8;13;71;226;229;232B;237;281;301;351;379;490;633; 658).

Cape Verde Islands (100;183;351;411).

Côte d'Ivoire (287).

Ghana (42A;297;299;300;335;336;338;344;376;377;487;491;537;567).

Guinea-Bissau (529).

Guinée (529).

Liberia (287).

Mauritanie (349;537).

Namibia (164).

St. Helena (533).

Salvage Islands (38B).

Sénégal (59;123;344;399;411;529;530;531;537;542).

West Africa (290;344;479).

*Note.* Several of these references represent generalized statements secondarily based on more specific or similarly generalized data published elsewhere. Some of the records cover more than one undetermined species within *Laurencia*; examples are numbers 100 and 183 (Cape Verde Islands – spp. I and II); 490, 633, 529 and 530 (Guinée and Sénégal – 2 species, one identified as '*L. sp. A*'). Sourie (529: 119) also stated that one of his species resembles '*L. paniculata* (C. Ag.) J. Ag.'. Amongst the records are some regarded by publishing author(s) as new species (albeit often with doubt, e.g. 164: 437); sterile material sometimes prevented further critical work (38B), occasionally subsequently resolved and reflected in specific entries.



**Lejolisia mediterranea** Bornet

Canaries (665).

**Leptofaucha brasiliensis** Joly

Canaries (664).

**Leptofaucha rhodymenioides** Taylor

Cape Verde Islands (Prud'homme van Reine, collected on CANCAP VII expedition).

**Leptophytum** Adey (1966), nomen inquirendum

The status and disposition of the genus *Leptophytum* Adey (669: 323) is unresolved. The generic type collection [i.e. the type of *L. laeve* (Stroemfelt) Adey] is missing and thus application of the name *Leptophytum* lacks the nomenclatorial foundation essential for stability (Woelkerling, 1988: 2–3, 217–218). In addition, Woelkerling & Irvine (1986a: 76–77) questioned whether *Leptophytum* should be recognized as a distinct genus, noting the difficulties outlined by Adey (669: 28) in ascribing species to *Leptophytum* vs *Phymatolithon*. Nevertheless, Chamberlain (1990: 198) felt that 'As an interim statement, therefore, I consider that *Leptophytum* should be accepted as a distinct genus, and that it and *L. laeve* should be interpreted according to Adey's (1966) concepts until further data are available'. The present account follows Woelkerling (1988), where *Leptophytum* is not recognized as a distinct genus but rather is treated as a nomen inquirendum and thus a genus requiring further evaluation. Two species ascribed to *Leptophytum* have been recorded from the region under consideration.

**Leptophytum bisporum** (Foslie) W. Adey

See *Phymatolithon bisporum* (Foslie) Afonso-Carrillo.

*Note.* This species was originally described as *Lithothamnion bisporum* Foslie (1906b: 18) based on material from Puerto Orotava, Tenerife, Canary Islands. Subsequently, Adey (669: 30) transferred the species to *Leptophytum* and then Afonso-Carrillo (11: 134) placed it in *Phymatolithon*. Data on the holotype are provided by Woelkerling (678: 39).

**Leptophytum bornetii** (Foslie) W. Adey

See *Lithothamnion bornetii* Foslie.

**Leptosiphonia schousboei** (Thuret in Bornet & Thuret) Kylin

Canaries (684).

**Leptosiphonia** sp.

Sénégal (59).

*Note.* Occurs in the Bodard & Mollion (59) text only in the terminal table IIID (Dredging along the coast of the '... Sud de la petite côte ... Sénégal').

**Liagora**

A complex genus on which much work remains to be done. Abbott's recent (656,688) studies of type material relevant to J. Agardh's (1896) and Lamouroux's (1812) works on the genus indicated much duplication of names among subgeneric

taxa and misappreciation of 'species' limits, apart from mis-determinations and omission of many previously published taxa. She was still moved to comment that, of taxa known by 1896, 'many remain little-known to this day'. All of which makes usage of names in the list area require some reservation and confirmation.

**Liagora albicans** Lamouroux

[As *Liagora decussata* Montagne]  
Ascension (475).

Canaries (38;68;139;390;408;439;598).

Cape Verde Islands (25;38;131;191;318;407;408;410;423;528;551;564;597;598;688).

*Note.* Kützing's (318: 538) statement 'Ad insulae St. Vincentii oras rejecta' presumably refers to the Cape Verde Islands. J. Agardh's (25: 429) description was quoted direct from Kützing (318) '... ad insularum St. Vincentii'. The Latin description was also given in full in Webb (551) where he referred to 'Montag. MS'. Both that and Montagne's (1849: 64) description were published in the same year, with Montagne published in January 1849 and Webb in November–December 1849. The most recent review of the genus (656: 308; 688: 119) concluded that *L. decussata* is a later synonym of *L. albicans* Lamouroux.

**Liagora canariensis** Børgesen

Canaries (2;3;8;13;16;38B;38D;68;191;226;227;235;236;237;303;351;375;379;489;598;634).

Salvage Islands (38B;38D;598).

[As *Liagora fragilis* Zanardini var.]

Canaries (439 pro parte).

*Note.* Piccone (439) gave this (p. 55) in his summary list of species recorded by Liebetrueth and Bolle. *L. fragilis* was apparently a Liebetrueth record. One of us (PVR) has examined the specimens on which this record is based and found them to be referable to two species, *L. canariensis* and *L. distenta*.

*General note.* Acuña Gonzales (2) stated: '... en nuestro archipiélago [Islas Canarias] también existen algunas [especies] que son endémicas, como ... *Liagora canariensis*. ...'. With substantiable records from elsewhere, this statement is clearly in error. Levring (375) has also recorded the species from Cabo Girão, Funchal and Deserte Grande, both Madeira group, and observed (375: 54): '... no doubt closely related to *L. valida* and it may be difficult to tell them apart. ...'. This comment is probably based on Feldmann's (191: 414) own comment that *L. canariensis* is near to *L. valida*, a pantropical species present on both sides of the Atlantic. According to Abbott (656: 309, 312 et seq.) *L. valida* Harvey is itself a synonym of *L. fragilis* Zanardini.

**Liagora ceranoides** Lamouroux

Ascension (474).

Canaries (38B; 38D; 68; 72; 128A; 191; 226; 227; 303; 375; 556; 564; 584; 598; 651).

Cape Verde Islands (688).

Salvage Islands (38B;38D;231;375;556;556A;598).

'Warm Atlantic' (410).

[As *Liagora pulverulenta* Agardh]

Canaries (547).

*Note.* Lamouroux's (331: 239) original record (repeated in Lamouroux, 332) is given as '... Sur les côtes de l'île St. Thomas. Ded. Weber.'. This is presumably the West Indian island, not that in the Gulf of Guinea. See also the discussion by Abbott (688).

**Liagora complanata** C. Agardh

See *Liagora distenta* (Mertens in Roth) Lamouroux.

**Liagora corymbosa** Børgesen

See *Liagora farinosa* Lamouroux.

**Liagora decussata** Montagne

See *Liagora albicans* Lamouroux.

**Liagora distenta** (Mertens in Roth) Lamouroux

Canaries (13;38;38B;38D;68;191;226;227;229; 303;375;439; 489;490;517;556;584;598;634;648;688).

Salvage Islands (38B;38D;215;231;375;556;598).

‘... Atlántico de Cádiz a Canarias. . .’ (517).

‘... Atlantique (de Cadix aux Canaries)’ (188).

‘... wärmeren atlantischen Ocean. . .’ (502).

[As *Liagora complanata* Agardh]

Salvage Islands (381;439;452).

[As *Liagora distenta* (Mertens in Roth) C. Agardh]

Canaries (392).

Cape Verde Islands (683).

[As *Liagora distenta* J. Agardh var. *complanata* J. Agardh]

‘Warm Atlantic’ (410).

[As *Liagora fragilis* Zanardini var.]

Canaries (439 pro parte).

See note under *L. canariensis* Børgesen.

[As *Liagora ramellosa* Sonder ex Kützing]

Canaries (319).

[As *Liagora ramellosa* Sonder in Kützing]

Canaries (‘De Cadiz aux Canaries. . .’) (89).

*Note.* Reported by Weisscher (556) from the Salvage Islands solely on the basis of the Gil-Rodríguez et al. (231) record; not found by CANCAP Expeditions. Bornet himself (89: 105) indicated ‘Le *Liagora ramellosa* ne me paraît pas spécifiquement distinct du *L. distenta*’. See comment under *L. distenta* concerning the possible identity of the Salvage Island record. For discussion of type material, see Abbott (688).

**Liagora elongata** Zanardini

See *Liagora farinosa* Lamouroux.

**Liagora farinosa** Lamouroux

Canaries (1;16;18;68;80;191;227;229;230;372;416;564).

Cape Verde Islands (652;683;688).

?Príncipe (350;586).

?São Tomé (350;586).

‘Seems to occur in all warmer seas’ (68).

‘... widespread in warm temperate and tropical seas’ (350;586).

[As *Liagora corymbosa* Børgesen]

Salvage Islands (231).

[As *Liagora elongata* Zanardini]

Canaries (67;246;390;439;547).

[As *Liagora megagyna* Børgesen]

?Príncipe (535).

?São Tomé (535).

*Note.* Børgesen (68: 59–62) examined Lamouroux’s specimens from the Red Sea and confirmed the common identity of *L. farinosa*, *L. elongata*, *L. cheyneana* and *L. corymbosa* as a rather variable but characteristic plant. Abbott (656: 308 *et seq.*) has confirmed Børgesen’s conclusion. Steentoft (535) listed *L. megagyna* records from São Tomé and Príncipe. The latter record was based on exsiccata specimens collected by F. Newton, who never visited Príncipe (Steentoft, pers. comm.) so possibly there was a mistake on the label.

After re-examining Newton’s collection, Lawson & John (350) suggest the identity of the plants to be *L. farinosa* rather than *L. megagyna*; see also the latter entry. The most recent critical treatment of morphology and nomenclature in the species here maintained as *L. farinosa* Lamouroux is that begun by Abbott in 1984 (1) and carried further in 1990 (656: 308; 688: 122). In 1984 she commented that *L. farinosa* ‘... has a number of features about it that make recognition of the species easy. . .’. She went on to detail these, adding afterwards ‘Nevertheless, the taxon has been given at least 11 specific names . . . and as *L. farinosa* was designated as the type specimen of *Ganonema* Fan & Wang (1974). It was segregated from *Liagora* principally on the relationship of the carpogonial branch to its supporting branch and its location’. Most species of *Liagora*, including the type species *L. viscida*, show carpogonial branches that are accessory to an established vegetative branching pattern. Fan & Wang (1974) established that in *L. farinosa*, the carpogonial branches were borne only on secondary filaments, or tertiary filaments of a cortical cluster. Abbott (1) noted that the location of the carpogonial branches correlated strongly with the season or age of the plant, varying in position/location/bearing branchlet type; hence, since this is the feature by which the genus *Ganonema* is recognized, it is too unstable a character for generic distinction. The latter genus (*Ganonema farinosa* (Lamouroux) Fan & Wang and *Ganonema pinnetiramosa* (Yamada) Fan & Wang) was therefore reduced by Abbott (1) to synonymy with *Liagora farinosa* Lamouroux. See also Abbott (688).

**Liagora fragilis** Zanardini

[As *L. valida* Harvey]

Canaries (38C;598).

Cape Verde Islands (38C;100;183;191;423;598;652).

‘... warmer parts of the Atlantic and Pacific (Abbott, 1945). . .’ (416).

*Note.* See also under *L. distenta* (Mertens in Roth) Lamouroux and *L. canariensis* Børgesen.

**Liagora gymnarthron** Børgesen

Canaries (38B;68;88;191;565;598).

[As *L. gymnorthron* Børgesen]

Canaries (227).<sup>4</sup>

[As *Liagora* cf. *gymnarthron* Børgesen]

Salvage Islands (38B).

*Note.* Feldmann (191: 414) indicated that *L. gymnarthron* appears to approach *L. decussata* Montagne (Antilles). Audiffred & Weisscher’s Salvage Island record (38B) is expressed with doubt since their plant differed from Børgesen’s description in having regularly dichotomous branches dispersed as well as alternate/decussate on the main axes. According to Abbott (*pers. comm.* to Prud’homme van Reine) this is probably *L. distenta*. See also the entry for *L. albicans* Lamouroux.

**Liagora megagyna** Børgesen

Príncipe (535).

São Tomé (535).

*Note.* Steentoft (535: 121) indicated that only a single plant in poor condition was available to her. This was the Newton specimen from Príncipe; it is therefore not clear why she gave only São Tomé as the African distribution, but see *L. farinosa* entry. Steentoft (535) indicated that her determination must be regarded as uncertain. *Liagora farinosa* (q.v.) is suggested by Lawson & John (350; 586) as the most likely identity for the specimen.

**Liagora perforata**

An erroneous statement in Audiffred & Weisscher (38B: 19) regarding a ‘host’ of *Champia parvula* (C. Agardh) Harvey



on the island of Selvagem Grande. Presumably it correctly relates to *Laurencia perforata* Montagne, which is listed in the body of the text by the same authors.

### ***Liagora pulverulenta* C. Agardh**

See *Liagora ceranoides* Lamouroux.

*Note.* Yamada (564: 20–22) considered there to be two groups in the taxon *L. ceranoides*, rather easily distinguishable from each other on general habit. Since these had hitherto been called *pulverulenta* J. Agardh and *leprosa* J. Agardh he made new combinations at formal level: *L. ceranoides*  $\alpha$  *pulverulenta* (Agardh) Yamada and *L. ceranoides*  $\beta$  *leprosa* (J. Agardh) Yamada. Abbott (656: 308) has confirmed the common identity of *L. ceranoides* Lamouroux and *L. pulverulenta* Agardh, suggested by Børgesen (68: 58).

### ***Liagora ramellosa* Sonder ex/in Kützing**

See *Liagora distenta* (Mertens) Agardh.

### ***Liagora tetrasporifera* Børgesen**

Canaries (2;13;16;38B;38C;38D;57;68;88;188;191;214A;226;227;229;327;351;490;556;564;598).

Salvage Islands (38B;38C;38D;556;598).

[As *L. viscida* (Forsskål) C. Agardh]

Canaries (439; 547).

*Note.* Under the entry for *L. viscida* Piccone (439: 34) commented that he had only few specimens, differing somewhat from the typical form. One of us (PVR) has checked the Piccone specimens under this name and found them to be attributable to *L. tetrasporifera*. See also the entries for *Liagora viscida* (Forsskål) C. Agardh. There is some reason to believe that confusion has existed for this area in attribution of *viscida* as epithet to specimens likely to represent *tetrasporifera*. In the absence of definitive means of revision, we have not attempted to resolve the situation but have maintained the authors' naming patterns.

### ***Liagora valida* Harvey**

See *Liagora fragilis* Zanardini.

### ***Liagora viscida* (Forsskål) C. Agardh**

Canaries (38D;216;227;499;584;598).

St. Helena (259;401;655).

'Macaronesia' (656).

'... ad oras Europae et Africae; ad ins. St. Thomae. . .' (318).

'... In den wärmeren Teilen des Atlantischen Ozeans' (499).

'... in oceano Atlantico caldiore. . ; ad insulam Sancti Thomae. . .' (131).

'... littus occidentale (Press); ad insulam St. Thomae' (25).

'Nordwestafrika' (499).

'... wärmeren atlantischen Ocean. . .' (502).

[As *Liagora viscida* Agardh *S. laxa* Kützing]

?São Tomé (318).

[As *Liagora viscida* C. Agardh]

St. Helena (260).

'Warmer Atlantic' (410).

[As *Liagora viscida* Forsskål]

Canaries (142).

St. Helena (142;391).

*Note.* Available evidence tends to suggest that references above to 'St. Thomae' refer to the West Indian island and not to the African island of that name. Confusion has been caused by the form of citation in Kützing (318: 538), quoted in detail here. Data are

included for completeness. Problems of determination, referred to in the note to *Liagora tetrasporifera* Børgesen (q.v.), have been worsened by the characteristic referred to by Feldmann (188: 271) '... cette algue est assez polymorphe. . . '.

### ***Liagora* spp.**

Canaries (5;38C;89;117;118;229;247;301;302;304;490;567).

Cape Verde Islands (552).

*Note.* Weber-van Bosse (552) identified material as *Liagora*, possibly a new species, and Bornet (89) indicated he detected six species amongst Schousboe's material. Audiffred (38C: 179) made the interesting point 'Even Isabella Abbott did not recognise this species'!

### ***Lictoria taxiformis* (Delile) J. Agardh**

See *Asparagopsis taxiformis* (Delile) Trevisan.

### ***Litholepis***

Based on studies of relevant type collections, Woelkerling (1986) concluded that *Litholepis* Foslie (203: 5) was a heterotypic synonym of *Titanoderma* Nägeli (1858: 532). Subsequently, Campbell & Woelkerling (1990) subsumed *Titanoderma* into *Lithophyllum* Philippi (1837: 387), and Woelkerling & Campbell (1992: 81) concluded that the type species of *Litholepis*, *L. caspica* (Foslie) Foslie, was a heterotypic synonym of *Lithophyllum pustulatum* (Lamouroux) Foslie. These conclusions are followed in this paper. Two species ascribed to *Litholepis* have been recorded from the region under consideration.

### ***Litholepis mediterranea* Foslie**

Cape Verde Islands (366;368;598).

*Note.* The status and disposition of this species are uncertain, and records from the Cape Verde Islands require confirmation once a detailed study of the holotype (see 678: 147) has been undertaken. The holotype was collected at Banyuls sur Mer, France. Feldmann (188: 317) referred the species to *Fosliella* (now considered a heterotypic synonym of *Hydrolithon*; Penrose & Chamberlain, 1993) while Adey (669: 15) referred the species with some doubt to *Lithoporella*. Both *Hydrolithon* and *Lithoporella* belong to the subfamily Mastophoroideae (Woelkerling, 1988: 115) whereas the type of *Litholepis* belongs to the subfamily Lithophylloideae (Woelkerling, 1988: 92).

### ***Litholepis sauvageau* Foslie**

See *Lithoporella sauvageau* (Foslie) Adey.

### ***Lithophyllum* Philippi**

The concept of *Lithophyllum* adopted in this paper follows Woelkerling & Campbell (1992: 17). According to this concept, the following characters collectively delimit *Lithophyllum* from other genera of Corallinaceae: 1) thallus nongeniculate; 2) crustose portions of thallus with a dorsiventral internal organization; 3) haustoria absent; 4) cells of contiguous vegetative filaments commonly joined by secondary pit-connections; 5) fusions between vegetative cells absent or very rare; 6) tetrasporangial/bisporangial conceptacles uniporate; and 7) tetrasporangia/bisporangia lacking apical plugs. The earlier taxonomic history of *Lithophyllum* is summarized by Woelkerling (1983b), who also provided accounts of the original collections of the four species that

Philippi (1837) included in the genus *Hyperantherella* Heydrich (1900: 316) and *Crodelia* Heydrich (1911: 12) are homotypic synonyms of *Lithophyllum* (see Woelkerling, 1988: 99–100). Heterotypic synonyms include *Dermatolithon* Foslie (682: 11) (a homotypic synonym of *Titanoderma*; see below and also Woelkerling et al., 1985 and Campbell & Woelkerling, 1990), *Litholepis* Foslie (203: 5) (see Woelkerling, 1986: 260; Woelkerling & Campbell, 1992: 81), *Perispermion* Heydrich (1900: 316) (see Woelkerling, 1991), *Pseudolithophyllum* Lemoine (1913a: 45) (see Woelkerling, 1988: 103), *Stichospora* Heydrich (1900: 316) (see Woelkerling, 1983a: 184; Woelkerling, 1988: 102), and *Titanoderma* Nägeli (1858: 532) (see Campbell & Woelkerling, 1990). Chamberlain (1991: 13, 23–24) and Chamberlain et al. (1991: 164–165) proposed that *Titanoderma* be maintained as a genus distinct from *Lithophyllum*, but Woelkerling & Campbell (1992: 17–18) concluded that characters suggested by Chamberlain (1991) and Chamberlain et al. (1991) to be diagnostic of *Titanoderma* (a predominance of primigenous palisade cells and the occurrence of at least some bistratose margin) were too variable in southern Australian collections to be used reliably in generic delimitation.

### ***Lithophyllum absimile* Foslie & Howe in Foslie**

See under *Spongites wildpretii* Afonso-Carrillo.

### ***Lithophyllum accretum* (Foslie & Howe) Lemoine**

See *Neogoniolithon accretum* (Foslie & Howe) Setchell & Mason.

### ***Lithophyllum accretum* (Foslie & Howe) Lemoine f. *canariensis* Foslie**

See notes under *Neogoniolithon accretum* (Foslie & Howe) Setchell & Mason.

### ***Lithophyllum accretum* (Foslie & Howe) Lemoine var. *canariense* (Foslie) Lemoine**

See notes under *Neogoniolithon accretum* (Foslie & Howe) Setchell & Mason.

### ***Lithophyllum aequinoctiale* Foslie**

See *Porolithon aequinoctiale* (Foslie) Foslie.

### ***Lithophyllum africanum* Foslie**

See *Porolithon africanum* (Foslie) Foslie.

### ***Lithophyllum amplexifrons* (Harvey) Heydrich**

See *Pneophyllum amplexifrons* (Harvey) Chamberlain & Norris.

### ***Lithophyllum aninae* Foslie**

Cape Verde Islands (6;100;101;136;139;207;210;212;366;597;598;678).

*Note.* Foslie (207: 28) based *Lithophyllum aninae* on a single collection from São Vicente, Cape Verde Islands. Adey (669: 4) referred the holotype to *Lithophyllum* without comment. The holotype (678: 27), however, has not been studied in detail in a modern context, and thus the status and disposition of the species are

uncertain, as is the identification of specimens from the West African region.

### ***Lithophyllum applicatum* Lemoine in Børgesen**

See *Neogoniolithon hirtum* (Lemoine in Børgesen) Afonso-Carrillo.

### ***Lithophyllum bisporum* Foslie**

See *Phymatolithon bisporum* (Foslie) Afonso-Carrillo.

### ***Lithophyllum byssoides* (Lamarck) Foslie.**

Mauritanie (356;359;360).

[As *Goniolithon byssoides* (Lamarck) Foslie]

Mauritanie (354).

*Note.* This species was originally described as *Nullipora byssoides* Lamarck (1801: 374) and was based on material depicted by Seba (1758: pl. 116, fig. 7). Subsequently, the species has been placed in *Millepora* (Lamarck, 1816: 203), *Lithothamnion* (Philippi, 1837: 388), *Spongites* (Kützinger, 1869: 35), *Goniolithon* (Foslie, 1898a: 5), *Lithophyllum* (682: 20), and *Titanoderma* (Chamberlain & Woelkerling in Woelkerling, 1988: 260). Woelkerling (1983a: 177–180, figs 12–16) outlined the nomenclatural history of the species, neotypified it with a Philippi collection and provided an account of that material. Later, Woelkerling (1988: 216, 217, 260) concluded that the species belonged to *Titanoderma* sensu Woelkerling et al. 1985 (see also Woelkerling, 1988). Following Campbell & Woelkerling (1990) and Woelkerling & Campbell (1992), *Titanoderma* is regarded here to be a heterotypic synonym of *Lithophyllum*, and thus *Nullipora byssoides* is dealt with as a *Lithophyllum*. Specimens on which the records from Mauritanie are based now need to be re-examined to determine whether they are conspecific with the neotype of *L. byssoides*.

### ***Lithophyllum calcareum* (Pallas) Areschoug**

See *Phymatolithon calcareum* (Pallas) Adey & McKibbin.

### ***Lithophyllum canariensis* Foslie**

See *Mesophyllum canariensis* (Foslie) Lemoine.

### ***Lithophyllum capense* Rosanoff**

Cape Verde Islands (38;598).

‘. . . Afrique méridionale. . .’ (38).

[As *Lithothamnium capense* (Rosanoff) Foslie]

Canaries (354).

*Note.* Rosanoff (1866: 86) based this species on material from southern Africa that Hohenacker had distributed as *Alg. mar. sicc.* no. 236. Type material of this species has not been studied in detail in a modern context, and thus the status and disposition of the species are uncertain as is the identification of specimens from the West African region.

### ***Lithophyllum caribaeum* Foslie**

See *Neogoniolithon caribaeum* (Foslie) Adey.

### ***Lithophyllum corallinae* (P. & H. Crouan) Heydrich**

Mauritanie (349).

[As *Dermatolithon corallinae* (P. & H. Crouan) Foslie]

Salvage Islands (38B;231;375).

[As *Melobesia corallinae* Solms-Laubach]

Mauritanie (59;252).

Sénégal (252).



[As *Melobesia corallinae* Crouan]

Canaries (439)

*Note.* Detailed accounts of this species, including information on the lectotype, are provided by Chamberlain (1991: 66–69, figs 208–224, as *Titanoderma*) and Woelkerling & Campbell (1992: 41–56, figs 22–32). All specimens on which published records for the West African region are based need to be checked to determine whether they are conspecific with the lectotype. *Lithophyllum corallinae* also was referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this critical assessment series.

***Lithophyllum cristatum* Meneghini f. *crassa* (Lloyd) Hauck**

See *Tenarea tortuosa* (Espoer) Lemoine.

***Lithophyllum crouanii* Foslie**

Canaries (598).

[As *Lithophyllum crouani*]

Canaries (235).

*Note.* The lectotype material (678: 68) of *Lithophyllum crouanii* was collected at Berwick-on-Tweed, England and has been examined in detail by Chamberlain et al. (1988), who also provided an account of the species in the British Isles. Records of this species from the Canary Islands require confirmation, especially in view of the misidentifications uncovered by Chamberlain et al. (1988).

***Lithophyllum cystoseirae* (Hauck) Heydrich.**

Annobón (455).

[As *Dermatolithon cystoseirae* (Hauck) Huvé]

Canaries (227;582)

Mauritanie (262;349;367;368).

[As *Dermatolithon cystoseirae* (Hauck) Foslie]

Mauritanie (367).

[As *Dermatolithon cystoseirae* (Hauck) Foslie f. *saxicola* Huvé]

Canaries (368).

Mauritanie (368).

[As *Dermatolithon cystoseirae* (Hauck) Foslie var. *saxicola* Huvé]

Canaries (368).

Mauritanie (368).

‘. . . Atlantique (de l’Angleterre à la Mauritanie). . .’ (33)

[As *Melobesia cystoseirae* Hauck]

Annobón (139)

[As *Dermatolithon papillosum* (Zanardini) Foslie var. *cystoseirae* (Hauck) Lemoine]

Annobón (350)

‘. . . Gulf of Guinea region. . .’ (350;367)

*Note.* This species was originally described as *Melobesia cystoseirae* (Hauck, 1883: 266, pl. 3, figs 1, 2, 6) and was based on specimens from the Adriatic Sea. Studies of type material by Huvé (272) and Athanasiadis (1989) have confirmed that this species belongs to *Lithophyllum* as delimited by Campbell & Woelkerling (1990) and Woelkerling & Campbell (1992), but a thorough study of reproductive anatomy needs to be undertaken before the relationships of it to others in the genus can be properly determined. Once such a study is completed, all specimens on which published records for the West African region are based need to be re-examined to determine whether they are conspecific with the type. *Lithophyllum cystoseirae* was also referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this series.

***Lithophyllum daedaleum* Foslie & Howe**

Canaries (666).

*Note.* Foslie & Howe (1906: 133) based this species on material from Puerto Rico. The holotype (678: 70) has not been studied in detail in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of the material from the Canary Islands.

***Lithophyllum decussatum* (Ellis & Solander) Philippi f. *planiscula* Foslie**

Canaries (211).

*Note.* Foslie (211: 22) based *Lithophyllum decussatum* f. *planiscula* on material from Morocco (see 678: 173) that previously had been referred to *Lithophyllum expansum*. Foslie (211: 23) also suggested that ‘En lignende form foreligger ogsaa fra de Kanariske øer’ but Foslie did not definitely refer the Canary Islands material to f. *planiscula*. No such specimen is filed in the Foslie herbarium under *Lithophyllum decussatum* (6: 44), and until the relevant specimen is located and examined in a modern context, this record must be regarded as questionable.

***Lithophyllum duckeri* Woelkerling**

Ascension (541).

[As *Lithothamnion crassum* Philippi]

Ascension (541).

Canaries (547;598).

St Helena (142;260;391).

*Note.* *Lithophyllum duckeri* is a nom. nov. for *Lithothamnion crassum* Philippi. An account of the lectotype and the nomenclatural history of *Lithophyllum duckeri* are provided by Woelkerling (1983a: 180–184, figs 17–22), who showed that the type of *Lithothamnion crassum* belonged to *Lithophyllum*. Upon transfer into *Lithophyllum*, the new specific epithet *duckeri* was required because Rosanoff (1866: 93) had used the combination *Lithophyllum crassum* for another species. Woelkerling (1983a) noted that the relationships of *L. duckeri* to other species of *Lithophyllum* was uncertain. The lectotype was collected from the west coast of Sicily. Subsequent studies of southern Australian species of *Lithophyllum* (Woelkerling & Campbell, 1992) have shown that characters relating to tetrasporangial conceptacle roof anatomy are important in species delimitation, and because these were not considered by Woelkerling (1983a), further studies of the type of *L. duckeri* are required before its status and relationships can be fully determined. Once such studies are completed, all specimens on which records from Ascension, the Canaries, and St. Helena are based must be checked to determine whether they are conspecific with the lectotype of *L. duckeri*.

***Lithophyllum esperi* (Lemoine in Børgesen) South & Tittley**

[As *Pseudolithophyllum esperi* Lemoine]

Canaries (70;191;227;362;363;499;582;598).

Cape Verde Islands (366;598).

‘. . . Golfe de Guinée. . .’ (366;586).

‘Tropical Africa (N.Gambia-Congo river)’ (598).

*Note.* Lemoine (363: 63) based this species on four collections from Puerto Orotava, Tenerife, Canary Islands but did not designate a type. South & Tittley (1986: 43) transferred the species into *Lithophyllum*, but the original collections of Lemoine, from which a lectotype must be chosen, have not been studied in detail in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of other specimens from the West African region.

**Lithophyllum expansum** Philippi

See *Mesophyllum lichenoides* (Ellis) Lemoine.

**Lithophyllum geometricum** Lemoine

Canaries (191;362;363;687)

[As *Dermatolithon geometricum* (Lemoine) Dawson]

Canaries (227;366;367;368;369;582;674).

Cape Verde Islands (366;367;368;369;582).

‘. . . Atlantique african. . .’ (369).

[As *Lithophyllum* sp. (*geometricum*?)]

Canaries (230).

[As *Lythophyllum* sp. (*geometricum*?) Lemoine]

Canaries (230).

*Note.* Lemoine (363: 47) based this species on two collections from Puerto Orotava, Tenerife, Canary Islands but did not designate a type. The species subsequently has been transferred to *Goniolithon* Setchell & Mason (1943: 89), *Dermatolithon* (674: 273) and *Titanoderma* (Price et al., 1986: 86). The type material apparently has not been re-examined in detail in a modern context and a lectotype has not been designated; thus the status and disposition of the species are uncertain, as is the identification of other specimens from the West African region. *Lithophyllum geometricum* also was referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this series.

**Lithophyllum gracile** Foslie

Cape Verde Islands (6;136;139;;207;210;212;366;597;598).

‘. . . Africa occidentale’ (136).

*Note.* A detailed study of the holotype collection (678: 108), which comes from São Vicente, Cape Verde Islands, has not been undertaken in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. Adey (669: 5) referred the holotype to *Lithophyllum* without comment.

**Lithophyllum hapalidioides** (P. & H. Crouan) Foslie

See *Lithophyllum pustulatum* (Lamouroux) Foslie.

**Lithophyllum hauckii** (Rothpletz) Lemoine

See *Neogoniolithon mamillosum* (Foslie) Setchell & Mason

**Lithophyllum hirtum** Lemoine in Børgesen

See *Neogoniolithon hirtum* (Lemoine in Børgesen) Afonso-Carrillo.

**Lithophyllum illitus** Lemoine in Børgesen

See *Neogoniolithon illitus* (Lemoine in Børgesen) Afonso-Carrillo.

**Lithophyllum incrustans** Philippi

Canaries (3;6;70;109;134;227;252;354;356;359;493;582;584;598;633).

Cape Verde Islands (100;366;375;598).

Mauritanie (6;248;252;349;356;359;631).

Western Sahara (252;349;631).

‘. . . Atlantique: depuis les côtes anglaises jusqu’en Mauritanie. . .’ (222).

‘. . . Atlantique (des Feroes à la Mauritanie, Iles du Cap Vert). . .’ (33).

‘. . . Atlantico norte (hasta Marruecos y Mauritania)’ (517).

‘. . . Atlantique nord (jusqu’au Maroc et à la Mauritanie)’ (188).

‘. . . côtes . . . africaine de l’Atlantique. . .’ (357).

‘. . . si commune sur les côtes atlantique à marée basse. . .’ (359).

‘subtropical Africa (N. of Gambia); Mauritania; former W. Sahara’ (598).

[As *Lithophyllum incrunstans*[sic!] Philippi]

Canaries (253).

Cape Verde Islands (253).

‘. . . Atlántico Oriental (Inglaterra – Cabo Verde). . .’ (253).

[As *Lithothamnion incrustans* (Philippi) Foslie]

Canaries (547).

[As *Lithothamnion ponderosum* Foslie]

São Tomé (197;265).

*Note.* Records of this species from the West African region require confirmation. An account of the holotype is provided by Woelkerling (1983b: 313–317, figs 15–22), but unfortunately, details of tetrasporangial conceptacle roof anatomy, now known (Woelkerling & Campbell, 1992) to be important in species delimitation within *Lithophyllum*, were not included and further study of the type is required. The holotype was collected along the west coast of Sicily.

**Lithophyllum irregulare** (Foslie) Huvé ex Steentoft

Canaries (535).

São Tomé (535).

[As *Lithophyllum irregularis* Foslie]

Canaries (227).

[As *Lithothamnium irregulare* Foslie]

São Tomé (206;350;586).

‘. . . in warm temperate and tropical parts of the eastern Atlantic Ocean’ (350;586).

[As *Lithothamnion irregulare* Foslie]

Canaries (582).

‘Gulf of Guinea’ (6;135;139;206;212;582).

‘. . . vestkysten af Afrika’ (209).

[As *Pseudolithophyllum irregulare* (Foslie) Adey]

Canaries (598).

‘Tropical Africa (N. Gambia-Congo river)’ (598).

[As *Tenera irregularis* (Foslie) Lemoine]

São Tomé (70).

*Note.* This species was originally described as *Lithothamnion irregulare* (206: 6), based on material from São Tomé. The species subsequently was transferred to *Tenarea* (363: 56), then to *Lithophyllum* (see below), and then with some doubt to *Pseudolithophyllum* (669: 13). The combination *Lithophyllum irregulare* was first effected by H. Huvé (1957: 138), but because Huvé did not cite the basionym (*Lithothamnion irregulare*, 206: 6), her combination is invalid (Article 33.2 in the *International code of botanical nomenclature*; see Greuter, 1988). Steentoft (535: 128) subsequently validated the combination which is correctly cited as either *Lithophyllum irregulare* (Foslie) H. Huvé ex Steentoft or *Lithophyllum irregulare* (Foslie) Steentoft. The holotype collection (678: 130) was examined by Steentoft (535: 128), but there is no detailed account of the holotype in a modern context, and thus the status and disposition of this species is uncertain. Retention here of the species in *Lithophyllum* is purely arbitrary as it is unknown whether the type possesses secondary pit-connections (characteristic of *Lithophyllum*) or cell fusions (implied by placement in *Pseudolithophyllum* sensu Adey, 1970). Further data on the name *Pseudolithophyllum* are provided by Woelkerling (1988: 103). All specimens on which published records for the West African region are based need to be checked to determine whether they are conspecific with the holotype.



**Lithophyllum kaiseri** (Heydrich) Heydrich

Annobón (586).

[As *Lithophyllum Kaiseri* Heydrich]

Annobón (367;368;455).

[As *Lithophyllum kotschyanum* Unger]

Annobón (139;397;455;457).

*Note.* This species originally was described as *Lithothamnion kaiseri* (Heydrich, 1897a: 64) and is based on material from El Tor, the Red Sea. Subsequently, Heydrich (1897b: 412) transferred the species to *Lithophyllum*. Heydrich did not designate a type, and Heydrich's main herbarium has apparently been destroyed (Stafleu & Cowan, 1979: 187; Hiepko, 1987: 230). However, syntype material occurs in TRH (678: 132). Because a lectotype has not been designated and studied in detail in a modern context, the status and disposition of the species are uncertain, as are the records from the West African region. According to Lemoine (368: 6), plants from Annobón identified by Pilger (455: 419) as *Lithophyllum kotschyanum* Unger are really *Lithophyllum kaiseri*. Once *L. kaiseri* has been lectotypified and studied in detail, Pilger's plants need to be re-examined to determine whether they are conspecific with the lectotype of *L. kaiseri*.

**Lithophyllum kotschyanum** Unger

See *Lithophyllum kaiseri* (Heydrich) Heydrich.

**Lithophyllum leptothalloideum** Pilger

Annobón (455;457).

[As *Pseudolithophyllum leptothalloideum* (Pilger) De Toni]

Annobón (139;350;586).

*Note.* A detailed study of the type material (whereabouts uncertain; see Stafleu & Cowan, 1983: 265), collected at Annobón, has not been undertaken in a modern context, and thus the status and disposition of this species are uncertain.

**Lithophyllum lobatum** Lemoine in Børgesen

Canaries (70;227;362;365;366;685;687).

Cape Verde Islands (366).

Mauritanie (349;366).

Sénégal (529).

'Lusitano-Africano-Méditerranéen' (529).

[As *Pseudolithophyllum lobatum* (Lemoine) Verlaque & Boudouresque]

Canaries (582;598).

Cape Verde Islands (598).

'N.W. Africa and Atlantic Islands' [translation] (582).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]' (598).

[As *Lithophyllum expansum* Philippi]

Canaries (211;493).

*Note.* Lemoine (363) states that: 'les échantillons déterminés sous le nom [*Lithophyllum expansum*] par M. Foslie, et cités par M. Sauvageau [493: 185] dans la localité de Puerto Orotava sont en réalité *L. lobatum*'.

[As *Mesophyllum lobatum* Lemoine]

Canaries (191).

*Note.* Lemoine (362: 40) based this species on four collections from Puerto Orotava, Tenerife, Canary Islands, but did not specify a type. As far as known, a lectotype has not been designated and there has been no detailed study of the protologue collections in a modern context. Thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. According to Lemoine (362), the cited entries for *Lithophyllum expansum* involve misidentified specimens. Feldmann (192: 414) used the binomial *Mesophyllum lobatum* Lemoine instead of *Lithophyl-*

*lum lobatum* Lemoine in Børgesen. It is not clear whether this is an error or whether Feldmann had intended to transfer *lobatum* to *Mesophyllum*; the binomial probably should be cited as *Mesophyllum lobatum* (Lemoine) Lemoine ex J. Feldmann.

**Lithophyllum marlothii** Heydrich

São Tomé (6;265).

[As *Lithophyllum Marlothii* Heydrich, forma]

São Tomé (251).

*Note.* Heydrich (1897b: 61) originally described this species as *Lithothamnion marlothii* but soon (Heydrich, 1897a: 410) transferred it to *Lithophyllum*. Heydrich based the species on collections from several localities in South Africa but did not designate a type. Heydrich's main herbarium apparently has been destroyed (Stafleu & Cowan, 1979: 187; Hiepko, 1987: 230), but syntype material of *L. marlothii* occurs in TRH (678: 145). Because a lectotype has not been designated and studied in detail in a modern context, the status and disposition of the species are uncertain, as are the records from the West African region.

**Lithophyllum mildbraedii** Pilger

Annobón (455;457;500).

Bioko (500).

Cameroun (500).

[As *Pseudolithophyllum mildbraedii* (Pilger) De Toni]

Annobón (139).

Bioko (350).

Cameroun (350).

'Tropical Africa (N.Gambia-Congo river)' (598).

'... only known from the eastern parts of the tropical Atlantic' (350; 386).

*Note.* A detailed study of the type material (whereabouts uncertain; see Stafleu & Cowan, 1983: 265), collected at Annobón, has not been undertaken in a modern context, and thus the status and disposition of this species are uncertain as are records from the West African region.

**Lithophyllum oligocarpum** Foslie

See *Porolithon onkodes* (Heydrich) Foslie.

**Lithophyllum orbiculatum** (Foslie) Foslie

Salvage Islands (38B;231;375).

'Norway to Morocco: W. Mediteranean' (649).

[As *Pseudolithophyllum orbiculatum* (Foslie) Lemoine]

Salvage Islands (598).

*Note.* A detailed study of the lectotype (678: 164), which comes from Kristiansund, Norway, has been undertaken by Chamberlain et al. (1991) who also noted confusions resulting from specimens being misidentified as *Lithophyllum orbiculatum*. Chamberlain et al. (1991: 161–162) did not confirm the occurrence of this species in the West African region, and all specimens on which published records from the area are based need to be checked to determine whether they are conspecific with the lectotype.

**Lithophyllum orotavicum** Foslie

See *Neogoniolithon orotavicum* (Foslie) Lemoine.

**Lithophyllum papillosum** (Zanardini ex Hauck) Foslie

Canaries (188;191;359;362;363;365).

[As *Dermatolithon papillosum* (Zanardini) Foslie]

Mauritanie (248).

[As *Goniolithon papillosum* (Zanardini) Foslie]

Canaries (18;582).

[As *Titanoderma papillosum* (Zanardini) Price, John & Lawson]

Annobón (586).

‘. . . Gulf of Guinea region. . .’ (586).

*Note.* This species was originally described as *Lithothamnion papillosum* Zanardini ex Hauck (1883: 272, pl. 2, fig. 4) and has been lectotypified (272: 224) with a collection from Susak Island in the Adriatic Sea. The lectotype has been examined by Huvé (272) and by Woelkerling (1988: 217–218). Further studies of the lectotype are required, however, to elucidate the reproductive anatomy of the species, to determine its status and disposition, and to determine the status and disposition of *Goniolithon* Foslie (1898a: 5), which is typified by *G. papillosum* (see Woelkerling, 1988: 217–218). Once these matters have been resolved, all specimens from the West African region ascribed to this species need to be checked to determine whether they are conspecific with the lectotype (see also 582: 25). *Lithophyllum papillosum* also was referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this series.

### **Lithophyllum polycephalum** Foslie

Canaries (6;212;493).

Cape Verde Islands (6;201;210;212;597).

[As *Lithophyllum* (*Dermatolithon*) *polycephalum* (Foslie) Foslie]

Canaries (191;362;363).

Cape Verde Islands (363;674).

[As *Dermatolithon polycephalum* (Foslie) Foslie]

Canaries (227;366).

Cape Verde Islands (139;366).

[As *Goniolithon polycephalum* (Foslie) Afonso-Carrillo]

Canaries (11;582).

Cape Verde Islands (582).

*Note.* Foslie (201) based this species on a collection from São Vicente, Cape Verde Islands. Although the holotype (678: 174) has been examined by Afonso-Carrillo (11: 139) and by Woelkerling & Campbell (1992: 22), a detailed study in a modern context has not been undertaken, and thus the status and disposition of this species are uncertain, as is the identification of specimens from the West African region. *Lithophyllum polycephalum* was also referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this critical assessment series.

### **Lithophyllum polyclonum** Foslie

[As *Dermatolithon polyclonum* (Foslie) Foslie]

Mauritanie (349).

*Note.* Foslie (201: 18) based this species on a collection from the West Indies. The holotype (678: 175) has not been studied in detail in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of the material from Mauritanie. *Lithophyllum polyclonum* also was referred to by Price et al. (1986: 86) under *Dermatolithon* in a previous part of this series.

### **Lithophyllum ponderosum** Foslie

See *Lithothamnion ponderosum* Foslie.

### **Lithophyllum proboscideum** (Foslie) Heydrich

See *Porolithon africanum* (Foslie) Foslie, and 678: 176.

### **Lithophyllum pustulatum** (Lamouroux) Foslie

Canaries (363)

[As *Lithophyllum* (*Dermatolithon*) *pustulatum* (Lamouroux) Foslie]

Canaries (109;354;356;359).

Mauritanie (359).

‘Cape Blanc, Sénégal’ (356).

[As *Dermatolithon pustulatum* (Lamouroux) Foslie]

Canaries (227;235;390;499;584).

Cape Verde Islands (366;499) .

‘Nordwestafrika’ (499).

[As *Melobesia* (*Dermatolithon*) *pustulatum*]

Canaries (6).

[As *Melobesia pustulatum* Lamouroux]

Canaries (441;444;547).

Cape Verde Islands (26;38;145;408).

‘Du Nord de la Grande-Bretagne aux Canaries’ (38;89).

[As *Lithophyllum pustulatum* Lamouroux f. *australis* Foslie]

Canaries (202;678).

[As *Dermatolithon hapalidioides* (P. & H. Crouan) Foslie]

Canaries (227;361;375;582).

Salvage Islands (38B;375).

[As *Dermatolithon hapalidioides* (P. & H. Crouan) Foslie f. *confinis* (P. & H. Crouan) Foslie]

‘. . . Atlantique (. . . Canaries. . .)’ (33).

[As *Lithophyllum hapalidioides* (P. & H. Crouan) Foslie]

Canaries (188;191;356;362;363).

[As *Lithophyllum hapalidioides* (P. & H. Crouan) Foslie var. *confinis* (P. & H. Crouan) Lemoine]

Canaries (363).

[As *Dermatolithon nepalidioides* (P. & H. Crouan) Foslie]

Salvage Islands (231).

*Note.* This species was originally described as *Melobesia pustulata* (331: 315). Woelkerling et al. (1985) lectotypified the species with a Lamouroux collection from France and provided a detailed account of the material. Additional data on the lectotype are provided by Chamberlain (1991, as *Titanoderma*) and Woelkerling & Campbell (1992). These workers examined the types of *Melobesia confinis* P. & H. Crouan and *M. hapalidioides* P. & H. Crouan and concluded that they are heterotypic synonyms of *Melobesia pustulata* Lamouroux. Chamberlain (1991, as *Titanoderma*) recognized four distinct varieties from the British Isles, whereas Woelkerling & Campbell (1992: 90–94) found so many intermediate specimens in southern Australia that it seemed to them neither desirable nor advantageous to recognize distinct varieties. Specimens on which all published records of *Lithophyllum pustulatum* from the West African region are based need to be checked to determine whether they are conspecific with the lectotype (also see 576: 25). Foslie (202: 117) based *Lithophyllum pustulatum* f. *australis* on specimens from a number of localities including the Canary Islands. Woelkerling (678: 35) designated the Canary Islands specimen as lectotype and provided additional comments. The lectotype, however, has not been studied in detail in a modern context, and thus the status and disposition of this taxon are uncertain. *Lithophyllum pustulatum* was also referred to by Price et al. (1986: 86) under *Dermatolithon*. Entries in this earlier part of the series for *Dermatolithon confinis*, *D. hapalidioides* and *D. nepalidioides* also pertain to *Lithophyllum pustulatum*.

### **Lithophyllum racemus** (Lamarck) Foslie

St. Helena (541).

*Note.* This species was originally described as *Millepora racemus* (Lamarck, 1816: 203) and is based on material from ‘les mers de la Guiane?’ collected by Turgot. Turgot’s material (whereabouts uncertain) has not been studied in detail in a modern context, and thus the status and disposition of this species is uncertain, as is the identification of the material from St. Helena. Additional notes on the name *Lithophyllum racemus* appear below in the entry for *Mesophyllum brachycladum*.



**Lithophyllum retusum** (Foslie) Foslie

Cape Verde Islands (683).

Ghana (6;211;350;535;586).

São Tomé (6;134;197;198;211;212;350;535;586).

‘... in tropical parts of the Atlantic ocean. . .’ (350;586).

[As *L. retusum* Foslie, forma]

São Tomé (251;265).

*Note.* Foslie (197: 15) first described this species as *Lithothamnion retusum*, but later (681: 9) transferred it to *Goniolithon* Foslie and then (682: 18) to *Lithophyllum* (see also 669: 5). The species is based on a single collection from São Tomé (Henriques no. 24, collected by Möller; see 197: 15). The holotype (678: 189), however, has not been examined in detail in a modern context and thus the status and disposition of the species are uncertain, as are records from the West African region. According to Steentoft (535), the Hariot (251: 164) and Henriques (265: 166) records of *Lithophyllum retusum* Foslie forma do not represent the same taxon. Several collections referred to by Steentoft (535) are represented in TRH (6: 43).

**Lithophyllum simile** Foslie

São Tomé (6;211;212;350;535;586).

‘... in tropical parts of the eastern Atlantic Ocean’ (350;586).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

*Note.* Foslie (211: 30) based *Lithophyllum simile* on a single collection from São Tomé. A detailed study of the holotype (678: 201), however, has not been undertaken in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. Adey (669: 6) referred the holotype to *Lithophyllum* without comment.

**Lithophyllum solutum** (Foslie) Lemoine

See *Lithothamnion solutum* (Foslie) Lemoine.

**Lithophyllum subtenellum** (Foslie) Foslie

São Tomé (6;190;251;265;350;586).

‘... widespread in warm temperate and tropical parts of the eastern Atlantic Ocean’ (350;586).

[As *Lithothamnium subtenellum* Foslie]

Mauritanie (359).

São Tomé (356;535).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

[As *Lithothamnium subtenellum* (Foslie) Lemoine]

São Tomé (188).

*Note.* A detailed study of the lectotype collection (678: 215; see also 669: 6), which comes from Guéthary, France, has not been undertaken in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region.

**Lithophyllum tortuosum** (Esper) Huvé

See *Tenarea tortuosa* (Esper) Lemoine.

**Lithophyllum vickersiae** Lemoine in Børgesen

Canaries (70;227;362;366;375;499;556;687).

Cape Verde Islands (366;556).

Sénégal (366).

‘... Atlantique (. . .Sénégal. . .Canaries)’ (33).

[As *Lithophyllum incrustans*]

Canaries (70;493;547).

[As *Lithophyllum* cf. *vickersiae* Lemoine]

Salvage Islands (38B;556).

*Note.* Determination based on external features only.

[As *Lithothamnium vickersiae* Lemoine]

Canaries (100;191).

[As *Pseudolithophyllum vickersiae* (Lemoine in Børgesen) Afonso-Carrillo]

Canaries (11;18;582).

Cape Verde Islands (598).

‘southern limit in the Gulf of Guinea’ [translation from the Spanish] (582).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

*Note.* Based on studies of the original Canary Islands collections of Lemoine (362: 42), Afonso-Carrillo (11: 139) decided that this species belonged to *Pseudolithophyllum* sensu Lemoine (1913). Subsequently, however, Woelkerling (1988: 103) concluded that *Pseudolithophyllum* sensu Lemoine (1913) is a heterotypic synonym of *Lithophyllum*, and thus *L. vickersae* is retained here in *Lithophyllum*. Afonso-Carrillo (11) did not designate a lectotype from amongst the seven collections cited in the protologue (362: 42), and he did not present a detailed account of the type material. Thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. According to Lemoine (362: 42), some plants of *L. vickersae* had earlier been associated with *L. incrustans* (see listings above).

**Lithophyllum zostericum**

See *Pneophyllum amplexifrons*.

**Lithophyllum** spp.

Cameroun (454).

Canaries (212;229;230;301;302;304).

Cape Verde Islands (652;683).

Namibia (348).

[As *Lythophyllum* sp.]

Canaries (229;230).

[As *Dermatolithon* sp.]

Canaries (253;314;582).

*Note.* Price et al. (1986: 86) also record *Dermatolithon* sp. in a previous part of this critical assessment series but provide no references.

**Lithoporella** Foslie

The concept of *Lithoporella* adopted in this paper follows Woelkerling (1988: 124–128). Historical data on the genus are summarized by Turner & Woelkerling (1982a, b), who also give an account of the lectotype species, *L. melobesoides* (Foslie) Foslie. A revised key to the genera of Mastophoroideae, including *Lithoporella*, is provided by Penrose & Chamberlain (1993: 303). According to Turner & Woelkerling (1982b: 233) and Woelkerling (1988: 128), uncertainties surrounds the delimitation and circumscription of most species in the genus.

**Lithoporella atlantica** (Foslie) Foslie

See note to *Lithoporella melobesoides* (Foslie) Foslie.

**Lithoporella conjuncta** (Foslie) Foslie

Cape Verde Islands (139;366;597).

Mauritanie (139;211;349;366;597).

Sénégal (597)

[As *Lithoporella* (*Eulithoporella*) *conjuncta* Foslie]

‘Atlantique africain’ (371).

[As *Mastophora* (*Lithoporella*) *conjuncta* Foslie]

Cape Verde Islands (6;136;207).

Mauritanie (6;136;207;210;212).

*Note.* This species was originally described as *Mastophora conjuncta* Foslie (207: 30) and is based on collections from Cap Blanc, West Africa and São Vicente, Cape Verde Islands. Subsequently, Foslie (211: 59) transferred the species to *Lithoporella*, and Adey (669: 15) lectotypified it with the Cap Blanc collection. A detailed study of the lectotype (678: 61) has not been undertaken in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region.

**Lithoporella melobesioides** (Foslie) Foslie

Cape Verde Islands (366;598).

Mauritanie (366).

‘Pantropical’ (366).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]. . .’ (598).

*Note.* The lectotype collection (678: 148), from South Nilandu, Maldiv Islands, has been studied in detail by Turner & Woelkerling (1982a, b), who also provided an account of the species in southern Australia. All records of this species from the West African region require confirmation. Errors associated with the typification of *L. melobesioides* are indicated by Woelkerling (678: 148).

**Lithoporella sauvageau** (Foslie) Adey

Canaries (18;582;598).

Cape Verde Islands (582;598).

[As *Fosliella* (*Litholepis*) *sauvageau* (Foslie)]

Canaries (191).

[As *Litholepis* *sauvageau* Foslie]

Canaries (6;139;203;204;227;366;368;493;678;687).

Cape Verde Islands (366;368).

[As *Melobesia* (*Litholepis*) *sauvageau* Foslie]

Canaries (70;359;362).

Cape Verde Islands (100;633).

[As *Melobesia* *sauvageau* Foslie]

Canaries (235).

*Note.* This species was originally described as *Litholepis sauvageau* Foslie (203: 6) and is based on a single collection (678: 195) from Puerto Orotava, Tenerife, Canary Islands. Subsequently, the species was transferred to *Melobesia* (363: 66) and then to *Lithoporella* (669: 15). There has been no detailed study of the holotype in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region.

**Lithothamnion** Heydrich, 1897a: 412, nom. cons.; non *Lithothamnium* Philippi, 1837: 387.

The concept of *Lithothamnion* adopted in this paper follows Woelkerling (1988: 169). The taxonomic history of *Lithothamnion* Heydrich and of *Lithothamnium* Philippi are summarized by Woelkerling (1983a), who proposed (Woelkerling, 1985b) the conservation of *Lithothamnion* Heydrich with *L. muelleri* Lenormand ex Rosanoff as type species. This proposal has been approved and incorporated into the *Inter-*

*national code of botanical nomenclature* (Greuter, 1988: 116). Further data on the nomenclature and infrageneric classification are summarized by Woelkerling (1988: 173–175) who also noted that no world monograph of the genus has been published and that species concepts are poorly known. In the literature, the spellings *Lithothamnion* and *Lithothamnium* are both widespread. As the correct orthography is now *Lithothamnion*, all entries are made under that spelling.

**Lithothamnion amplexifrons** (Harvey) Lemoine

See *Lithophyllum amplexifrons* (Harvey) Foslie.

**Lithothamnion angolense** Romanes

Angola (139;370;677).

*Note.* *Lithothamnion angolense* is based on fossil material from four localities (677: 584). A detailed study of the type material (whereabouts uncertain) has not been undertaken in a modern context, and thus the status and disposition of this species are uncertain.

**Lithothamnion antarcticum** (Hooker f. & Harvey) Heydrich

See note to *Mesophyllum ectocarpum* (Foslie) Adey.

**Lithothamnion bisporum** Foslie

See *Phymatolithon bisporum* (Foslie) Afonso-Carrillo and notes under *Lithothamnion hispanum* Foslie ex Gonzalez Henriques.

**Lithothamnion bornetii** Foslie

Canaries (227; 598).

*Note.* This species originally was described as *Lithothamnion bornetii* Foslie (1898b: 9). Subsequently, Adey (669: 30) transferred the species to *Leptophyllum* (see comments on *Leptophyllum* under the entry for that genus), but then Adey & Adey (1973: 347, as *Lithothamnion*) indicated that the species was either a *Leptophyllum* or a *Phymatolithon* and that it occurred in France, Spain, and the British Isles. Parke & Dixon (1976: 534) then placed the species in *Phymatolithon* while South & Tittley (1986: 44) made the combination *Phymatolithon bornetii* (Foslie) Foslie. Foslie never placed this species in *Phymatolithon*, and the binomial *Phymatolithon bornetii* coined by both Parke & Dixon (1976) and South & Tittley (1986) is invalid because a full reference to the basionym was not made in accordance Article 33.2 of the *International code of botanical nomenclature* (see Greuter, 1988). Chamberlain (1990, as *Leptophyllum*) provided an account of British Isles material and of an isotype from France in PC. Chamberlain (1990) also reported that some specimens from France identified as ‘*bornetii*’ by Lemoine were misidentified plants of *Phymatolithon purpureum* (P. & H. Crouan) Woelkerling & L. Irvine, and she was unable to confirm the French and Spanish records of Adey & Adey (1973). Information on the holotype is provided by Chamberlain (1990) and Woelkerling (678: 41). Records of this species from the Canary Islands require confirmation, and the generic placement of the species requires further evaluation once the status of *Leptophyllum* as a genus is clarified.

**Lithothamnion brachycladum** Foslie

See *Mesophyllum brachycladum* (Foslie) Adey.



**Lithothamnion brassica-floridum** (Harvey) Areschoug

See *Neogoniolithon brassica-florida* (Harvey) Setchell & Mason.

**Lithothamnion calcareum** (Pallus) Areschoug

See *Phymatolithon calcareum* (Pallus) Adey & McKibbin.

**Lithothamnion californicum** Foslie

See note on *Phymatolithon tenuissimum* (Foslie) Adey.

**Lithothamnion canariense** Foslie

See *Mesophyllum canariense* (Foslie) Lemoine.

**Lithothamnion capense** (Rosanoff) Foslie

See *Lithophyllum capense* Rosanoff.

**Lithothamnion corallioides** P. & H. Crouan

Canaries (15;18;582;648).

Cape Verde Islands (582).

*Note.* P. & H. Crouan (1867: 151, pl. 20, gen. 133, figs 8–10) based *Lithothamnion corallioides* on material from Brest, France. The type material has not been studied in detail in a modern context and thus the status and disposition of this species are uncertain, as is the identification of specimens from the West African region.

**Lithothamnion corticiformis** (Kützinger) Foslie

See *Melobesia membranacea* Kützinger.

**Lithothamnion crassum** Philippi

See *Lithophyllum duckeri* Woelkerling.

**Lithothamnion crispatum** Hauck

Mauritanie (356).

[As *Lithothamnium Philippii* Foslie = *L. crispatum* Hauck] Mauritanie (354).

*Note.* Hauck (1878: 289) based *Lithothamnion crispatum* on specimens from Rovigno in the Adriatic Sea. Subsequently, Hauck (1883: 270) transferred the species to *Lithophyllum*. Foslie (1898a) then transferred the species to *Archaeolithothamnion*, but later (Foslie, 1904: 13) reclassified it as *Lithothamnion philippii* f. *crispata* (Hauck) Foslie. There has been no detailed study of the type material in a modern context, and thus the status and disposition of the species is uncertain, as noted by Athanasiadis (668: 41). Once such a study is undertaken, the specimens from Mauritanie need to be checked to determine whether they are conspecific with the type.

**Lithothamnion ectocarpon** Foslie

See *Mesophyllum ectocarpon* (Foslie) Adey.

**Lithothamnion erubescens** Foslie

See *Mesophyllum erubescens* (Foslie) Lemoine.

**Lithothamnion floridanum** Foslie

See *Mesophyllum floridanum* (Foslie) Adey.

**Lithothamnion fruticosum** (Kützinger) Foslie

See *Spongites fruticosum* Kützinger.

**Lithothamnion hispanum** Foslie ex Gonzalez Henriques

Canaries (598).

[As *Lithothamnion hispanum* Foslie]

Canaries (235).

*Note.* Gonzalez Henriques (235) listed this entity from the Canary Islands and attributed the specific epithet to Foslie. As far as can be determined, however, neither Foslie (see 678) nor other earlier authors have described a species with the specific epithet *hispanum*, and thus the epithet appears to be newly coined by Gonzalez Henriques (235). The account of Gonzalez Henriques (235) lacks a description, and consequently, *Lithothamnion hispanum* must be considered a *nomen nudum*. It is possible that Gonzalez Henriques (235) was referring to *Lithothamnion bisporum* (treated in this series under *Phymatolithon*), a species based on type material from the Canary Islands (678: 39), but this cannot be confirmed.

**Lithothamnion incrustans** Philippi

See *Lithophyllum incrustans* Philippi.

**Lithothamnion indicum** Foslie

Mauritanie (6).

*Note.* A detailed study of the lectotype collection (678: 125), which comes from Corner Inlet, Victoria, Australia, is presently being undertaken in conjunction with monographic studies of non-geniculate corallines in southern Australia. Until that study is completed, the status and disposition of the species will remain uncertain. Once the study of the lectotype is complete, the specimen on which the record from Mauritanie is based needs to be checked to determine whether it is conspecific with the lectotype.

**Lithothamnion irregulare** Foslie

See *Lithophyllum irregulare* (Foslie) Huvé ex Steentoft.

**Lithothamnion lenormandii** (Areschoug) Foslie

See *Phymatolithon lenormandii* (Areschoug) Adey.

**Lithothamnion lichenoides** Heydrich

See *Mesophyllum lichenoides* (Ellis) Lemoine.

**Lithothamnion mamillare** (Harvey) Areschoug

See *Neogoniolithon mamillare* (Harvey) Setchell & Mason.

**Lithothamnion mamillosum** Hauck

See *Neogoniolithon mamillosum* (Hauck) Setchell & Mason.

**Lithothamnion membranaceum** (Esper) Foslie

See *Melobesia membranacea* (Esper) Lamouroux.

**Lithothamnion onkodes** Heydrich

See *Spongites onkodes* (Heydrich) Penrose & Woelkerling and the entry for *Porolithon*.

**Lithothamnion orbiculatum** Foslie

See *Lithophyllum orbiculatum* (Foslie) Foslie.

**Lithothamnion philippi** Foslie

Canaries (6;204;227;356;363;493;594;598).

Mauritanie (6;354;359).

Sénégal (248).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritanie; Former W. Sahara]’ (598).

[As *Mesophyllum philippi*] (Foslie) Adey]

Canaries (18).

*Note.* The complex nomenclatural history of this species is explained by Woelkerling (678: 171), who designated a new lectotype from the Gulf of Naples, Italy. The lectotype, however, has not been studied in detail in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of specimens from the West African region. Afonso-Carrillo et al. (576: 25, as *Mesophyllum*) commented that previous references to the taxon from the Canaries are doubtful and require confirmation.

**Lithothamnion polymorphum** auctorum

See entries for *Phymatolithon purpureum* (P. & H. Crouan) Woelkerling & L. Irvine and *Phymatolithon calcareum* (Pallas) Adey & McKibbin.

**Lithothamnion ponderosum** Foslie

São Tomé (197;265).

*Note.* Foslie (197: 15) based this species on a specified collection from São Tomé. Subsequently Foslie (211: 42) considered *Lithothamnion ponderosum* to be conspecific with *Lithophyllum africanum* Foslie (199: 3) but incorrectly adopted the 1900 epithet *africanum* rather than the 1897 epithet *ponderosum*. Steentoft (535: 128, under *Lithophyllum africanum* f. *intermedia*), provides some additional comments on the São Tomé material, but the holotype (678: 175) has not been studied in detail in a modern context and thus the status and disposition of the species are uncertain.

**Lithothamnion racemus** (Lamarck) Areschoug

See notes under *Mesophyllum brachycladum* (Foslie) Adey.

**Lithothamnion solutum** (Foslie) Foslie

Cape Verde Islands (6;210).

Mauritanie (6;252;356).

[As *Lithophyllum solutum* (Foslie) Lemoine]

Mauritanie (248;359;360;556).

Salvage Islands (38B;556).

[As *Mesophyllum solutum* (Foslie) Lemoine]

Cape Verde Islands (366;598).

Mauritanie (349;366).

Salvage Islands (598).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

*Note.* A detailed study of the lectotype collection (678: 203, as *Lithothamnion fruticosum* f. *soluta* Foslie) has not been undertaken in a modern context and thus the status and disposition of this taxon are uncertain, as is the identification of specimens from the West African region. This taxon was originally described as *Lithothamnion fruticosum* f. *soluta* Foslie (1904: 7). Subsequently it was raised to species status [as *Lithothamnion solutum* (Foslie) Foslie (204: 14)], then transferred to *Lithophyllum solutum* (Foslie) Lemoine (356: 13), and later transferred to *Mesophyllum solutum* (Foslie) Lemoine (366: 238; see also 349: 115). The binomial *Mesophyllum solutum* is

invalid because the combination was proposed without a full, direct reference to its basionym (Article 33.2 of the *International Code of Botanical Nomenclature*; see Greuter, 1988).

**Lithothamnion sonderi** Hauck

Canaries (177;191;227;362;365;375;582;584;598;631;649).

‘. . . côtes atlantique d’Europe (de la Norvège aux Canaries)’ (188).

*Note.* A detailed study of the type collection, which comes from Helgoland, Germany has been undertaken by Chamberlain (631), who also provides data on the species in the British Isles. Specimens on which published records for the West African region are based need to be checked to determine whether they are conspecific with the type.

**Lithothamnion subtenellum** Foslie

See *Lithophyllum subtenellum* (Foslie) Foslie.

**Lithothamnion tenuissimum** Foslie

See *Phymatolithon tenuissimum* (Foslie) Adey.

**Lithothamnion vickersiae** Lemoine

See *Lithophyllum vickersiae* Lemoine in Børgesen.

**Lithothamnion** spp.

Angola (312).

Cape Verde Islands (114;145;366).

Ghana (335;350;487;586).

Namibia (348;437;438).

Western Sahara (349;476).

**Lithothamnium**

In the literature, the spellings *Lithothamnion* and *Lithothamnium* both are widespread. As the correct orthography is now *Lithothamnion*, all entries are made under that spelling.

**Lomentaria articulata** (Hudson) Lyngbye

Canaries (2; 3; 8; 16; 38D; 70; 71; 191; 214; 226; 227; 229; 235; 375; 379; 392; 489; 490; 499; 517; 584; 598; 633).

Cameroun (239;350;454;500;586;591).

Salvage Islands (38B;38D;231;598).

Western Sahara (349).

‘. . . Atlantique (de la Norvège au Rio de Oro). . .’ (33).

‘. . . Atlantique: depuis les côtes anglaises jusqu’au Rio de Oro. . .’ (222).

‘A Boreal-Atlantic alga’ (2).

‘. . . Atlantique Nord (des Féroé aux Canaries). . .’ (189).

‘. . . Atlantischer Ozean von den Farøer an südwärts bis Westindien und Westafrika. . .’ (499).

‘. . . Atlántico norte (de Faeroes a Canarias)’ (517).

‘. . . Faerøes southwards to Morocco and the Canary islands. . .’ (70).

‘. . . Nordwestafrika’ (499).

‘. . . Norway (Nordland) to Cameroun; Canary Isles. . .’ (273).

‘. . . Tropical Africa (N. Gambia – Congo river)’ (598).

‘. . . West Küste Afrikas’ (239).

‘. . . widespread from boreal-antiboreal to tropical seas’ (350;586).



[As *Chylocladia articulata* Greville]

Canaries (439).

‘. . . den atlantischen – Cap Inseln. . .’ (239).

[As *Lomentaria articulata* Lyngbye]

Canaries (44;547).

[As *Lomentaria articulata* (Lightfoot) Lyngbye]

Canaries (401).

*Note.* Yarish et al. (591: 217–218) have commented upon the significance of the ill-supported Cameroun statements.

### ***Lomentaria baileyana* (Harvey) Farlow**

Canaries (598;667).

Mauritanie (Cap Blanc) (516; 565A).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

[As *Lomentaria baileyana* (Harvey) Farlow]

Mauritanie (349).

*Note.* In view of Bodard & Mollion’s (59) records from Sénégal, it is possible that these records (or even the whole taxon) should be transferred to (or referred to by the name of) *Lomentaria uncinata* Meneghini. See notes under *Lomentaria uncinata*. Cribb (113: 71–72) indicated the dichotomy of opinion that exists for the relationship of *L. baileyana* and *L. uncinata*, some authors considering them conspecific, others distinct.

### ***Lomentaria exigua* De Notaris**

See *Chylocladia reflexa* Lenormand.

### ***Lomentaria fastigiata* Kützinger**

São Tomé (132;323).

*Note.* Doubt expressed by De Toni (132) related to the possibility that this was the western Atlantic island, not that in the Gulf of Guinea. Included for completeness, since the situation is unclear.

### ***Lomentaria firma* (J. Agardh) Berthold**

Sénégal (59;399).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

[As *Lomentaria firma* (J. Agardh) Kylin]

Sénégal (531).

*Note.* See *Lomentaria* sp.1. Bodard & Mollion (59: 200) commented as follows: ‘. . . Les deux *Lomentaria* sont plus originaux et leur détermination a été délicate. Pour le premier nous avons trouvé dans l’herbier Thuret un *Chondria* provenant de l’île de Gorée (Herbier Le Prieur) sans détermination mais groupé avec le *Lomentaria firma* Berthold (*Chylocladia firma* J. Ag.). Cette espèce présente de nombreux synonymes, elle correspond au *L. firma* Kütz. *Tab. Phyc.* XV, t. 78 et vraisemblablement au *Chondrothamnion irregulare* Kütz. *Tab. Phyc.* XV, t. 82, décrit de la Méditerranée, elle se retrouve au Maroc dans l’herbier Schousboe, des échantillons Zanardini sont également de la même espèce et proches des nôtres, c’est donc une espèce africano-méditerranéenne . . . les deux *Lomentaria* sont irréguliers au Sénégal’.

### ***Lomentaria impudica* Montagne**

See *Catenella impudica* (Montagne) J. Agardh.

### ***Lomentaria kaliformis* sine auctorum**

See *Chylocladia verticillata* (Lightfoot) Batters.

### ***Lomentaria linearis* (Zanardini) Zanardini**

Canary Islands (Prud’homme van Reine, unpublished; collected during trip of Helgoland research vessel ‘Heincke’ to the Canaries).

### ***Lomentaria ovalis* (Hudson) J. Agardh**

See *Gastroclonium ovatum* (Hudson) Papenfuss.

### ***Lomentaria parvula* C. Agardh**

See *Champia parvula* (C. Agardh) Harvey.

### ***Lomentaria patens* Kützinger**

Namibia (128).

*Note.* By straightforward nomenclatural synonymy, this record of a single plant would probably have represented *Chylocladia verticillata* (Lightfoot) Bliding (q.v.). However, from this named location, the presence of that species as currently conceived is not credible. In regard to a similar report by the same authors from South Africa, Seagrief (570) has commented ‘? synonym of *Chylocladia capensis* Harvey. . .’ and the same comments could even more realistically be made here for Namibia.

### ***Lomentaria pygmaea* auctorum**

See *Gastroclonium reflexum* (Chauvin) Kützinger.

### ***Lomentaria reflexa* Chauvin**

See *Gastroclonium reflexum* (Chauvin) Kützinger.

### ***Lomentaria subdichotoma* Ercegovic**

Canaries (648).

### ***Lomentaria uncinata* Meneghini in Zanardini**

Sénégal (59).

‘. . . côtes occidentales d’Afrique et aux Canaries. . .’ (184).

*Note.* See *Lomentaria* sp. 2. Bodard & Mollion (59: 200) commented as follows: ‘. . . Les deux *Lomentaria* sont plus originaux et leur détermination a été délicate. . . La seconde est *Lomentaria uncinata* Menegh. (1840) dont le synonyme principal est *L. baileyana* . . . Farlow dont les variétés S et – sont identiques à l’espèce *L. uncinata*. Cette espèce peut-être considérée comme une tropicale atlantique. Ces deux *Lomentaria* sont irréguliers au Sénégal’. See also notes under *L. baileyana*. Boudouresque et al. (1984: 45) incorrectly cited the authorities for this taxon as (Meneghini ex Kützinger) Farlow.

### ***Lomentaria uvaria* (Wulfen) Duby**

See *Botryocladia botryoides* (Wulfen) J. Feldmann.

### ***Lomentaria* sp.**

Sénégal (529).

*Note.* Sourie (529: 108) recorded it in his list as ‘*Lomentaria* n. sp. Feldm.’ and in his notes (p. 116) as ‘encore non décrit par J. Feldmann’.

### ***Lomentaria* sp.1.**

Sénégal (55).

*Note.* See notes under *Lomentaria firma* (J. Agardh) Berthold.

**Lomentaria** sp.2.

Sénégal (55).

*Note.* See *Lomentaria uncinata* Meneghini.**Lophocladia trichoclados** (C. Agardh) Schmitz

Annobón (139;292;456;457).

Canaries (128A;139;292;633;634;648;662).

Ghana (290;292;299;300;350;376;377;491;586).

Príncipe (139;350;586).

Sierra Leone (30;350;586).

‘. . . widespread in warm temperate and tropical seas..’ (292?;350;586).

[As *Lophocladia trichoclados* (Mertens in C. Agardh) Schmitz]

Canaries (71;227;303;598;648).

Cape Verde Islands (598).

Príncipe (93).

São Tomé (93).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

[As *Lophocladia trichoclados* (Mertens) Schmitz]

Canaries (13;38D;191;226;375).

[As *Dasya trichoclados* J. Agardh]

Canaries (439;547).

**Lophosiphonia adhaerens** Pilger

Annobón (139;295;350;456;457;586).

?Sierra Leone (295).

St. Helena (655).

*Note.* See *Lophosiphonia* spp. for possible Sierra Leone records.**Lophosiphonia cristata** Falkenberg

Ascension Island (474).

Canaries (38B;634;657).

Salvage Islands (38B;598;657).

[As *Lophosiphonia* cf. *cristata* Falkenberg]

Canaries (38C).

*Note.* Audiffred (38C: 179–180) indicated that his specimens did not have the usual hooked apices of branchlets associated with *L. cristata*, nor did the rhizoids remain in open connection with the pericentrals. He debated the wide variation in reported numbers of pericentral cells in *Lophosiphonia* (4–18 according both to species and author); his own specimens had 9 pericentrals. The difficulties in distinguishing between sterile *Lophosiphonia* and *Polysiphonia* were indicated.

**Lophosiphonia obscura** (C. Agardh) Falkenberg in Engler & PrantlSee under *Lophosiphonia reptabunda* (Suhr) Kylin.**Lophosiphonia reptabunda** (Suhr in Kützing) Kylin

Angola (352).

Ascension (475).

Bioko (346;350;586).

Cameroun (350;586).

Canaries (38B;38C;38D;54;110;556;598;662;684).

Cape Verde Island (598).

Côte d’Ivoire (350;586).

Gabon (350;586).

Ghana (288;350;586).

Salvage Island (38B;38C;38D;556;598).

Sierra Leone (350;586).

St. Helena (655).

‘Atlantique (de l’Angleterre aux Canaries. . .)’ (33).

‘. . . in warm temperate and tropical parts of the Atlantic. . .’ (350;586).

‘. . . on many rocky shores of West Africa. . .’ (347A).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

‘. . . warmer parts of the Atlantic Ocean. . .’ (71).

[As *Lophosiphonia reptabunda* (Kützing) Kylin]

Angola (298).

Gabon (295).

Sierra Leone (295).

[As *Lophosiphonia reptabunda* Kylin]

Canaries (489;517).

[As *Lophosiphonia reptabunda* (Suhr in Kützing) Cribb]

Canaries (110).

[As *Lophosiphonia obscura* J. Agardh]

‘. . . cotes occidentale d’Afrique et aux Canaries. . .’ (184).

[As *Lophosiphonia obscura* (C. Agardh) Falkenberg]

Cameroun (337;537).

Canaries (108;227;375;482;584).

Cape Verde Islands (38).

Ghana (153;338;487).

‘. . . in den warmeren Teilen des Atlantischen Ozeans. . .’ (501).

‘. . . warmer parts of the Atlantic Ocean’ (62).

[As *Lophosiphonia obscura* Falkenberg]

Canaries (190).

[As *Lophosiphonia obscura* auct., Howe]

Canaries (71;191;310).

‘. . . in warmer parts of the Atlantic Ocean. . .’ (71).

[As *Lophosiphonia* sp.]

Ascension Island (474).

Sierra Leone (339).

[As *Polysiphonia obscura* J. Agardh]

Cape Verde Islands (38;145).

‘. . . au sud de l’Angleterre aux Canaries. . .’ (38;89).

[As *Polysiphonia reptabunda* Suhr]

‘Ad oras africanas’ (321).

‘. . . In mari atlantico subtropico ad Alga parasitica. . .’ (318).

*Note.* Erroneously recombined by Jaasund (280: 411) as *Lophosiphonia reptabunda* (Suhr) *nov. comb.* who seemed to be unaware of the fact that both Cribb and Kylin had carried out such recombination independently in 1956. Of these it appears that Kylin (281) antedated Cribb (110) who discussed (p. 140–141) its nomenclature. Kapraun et al. (310: 890–891) discussed the validity of records by Børgesen (71) from the Canaries, considering that the material concerned could not represent *Lophosiphonia obscura* and is probably a species of *Polysiphonia*. It would appear that *Lophosiphonia obscura* as such occurs north of the area considered here.

**Lophosiphonia scopulorum** (Harvey) Womersley

Canaries (633;634;648).

Salvage Islands (38B; 556).

*Note.* See also *Polysiphonia scopulorum* Harvey.**Lophosiphonia villum** (J. Agardh) Setchell & Gardner

See *Polysiphonia scopulorum* Harvey var. *villum* (J. Agardh) Hollenberg.



**Lophosiphonia** spp.

Ascension (474) (probably in the main referable to *L. reptabunda*).

Cameroun (460).

Cape Verde Island (652).

Ghana (299;376;377).

Sénégal (529).

Sierra Leone (295;339;350;468;586).

*Note.* The *Lophosiphonia* material referred to in 339 and 460 may well be *L. reptabunda* but the specimens cannot now be traced. The species referred to in 350 and 586 closely resembles the little-known *L. adhaerens* Pilger (456).

**Lophura episcopalis** (Montagne) Kützing

See *Halopitys incurvus* (Hudson) Batters.

**Lythophyllum calcareum** (Pallas) Areschoug

See *Phymatolithon calcareum* (Pallas) Adey & McKibbin.

**Lythophyllum** sp. (*geometricum*?) Lemoine

See *Lythophyllum geometricum* Lemoine and *Dermatolithon geometricum* (Lemoine in Børgesen) Price, John & Lawson.

**Lythophyllum** sp.

See *Lythophyllum* sp.

**Mastocarpus stellatus** (Stackhouse in Withering) Guiry in Guiry, West, Kim & Masuda.

Canaries (598;633;634;657).

‘... from northern Russia south to Portugal and from Morocco south possibly to Rio de Oro, Mauritania. . .’ (245;657).

[As *Gigartina stellata* (Stackhouse in Withering) Batters]

Canaries (13;227).

Mauritanie (349).

Western Sahara (349).

‘... Atlantique (de l’Arctique au Rio de Oro)’ (33).

‘... Atlantique: depuis la Scandinavie jusqu’au Rio de Oro. . .’ (222).

‘Circumboréale, . . . de l’Arctique aux Côtes Atlantique d’Europe et d’Afrique jusqu’à la Mauritanie. . .’ (173)

*Note.* The distributional statement in 657 is reproduced directly from Guiry et al. (245). Afonso-Carrillo et al. (657: 289) present the first report from the Canaries of what is probably the *Petrocelis cruenta* phase (the sporophyte) of *M. stellatus*; unfortunately, the material was sterile.

**Mastophora** Decaisne

The concept of *Mastophora* adopted in this paper follows Woelkerling (1988: 129–133) who provides nomenclatural and systematic data on the genus. Historical data on the genus are summarized by Turner & Woelkerling (1982a, b), who also give an account of the lectotype species, *M. licheniformis* Decaisne [a heterotypic synonym of *M. rosea* (C. Agardh) Setchell]. A revised key to the genera of Mastophoroideae, including *Mastophora*, is provided by Penrose & Chamberlain (1993: 303). According to Turner & Woelkerling (1982b: 233) and Woelkerling (1988: 133),

uncertainties surrounds the delimitation and circumscription of most species in the genus.

**Mastophora conjuncta** Foslie

See *Lithoporella conjuncta* (Foslie) Foslie.

**Mastophora melobesioides** Foslie

See *Lithoporella melobesioides* (Foslie) Foslie.

**Melobesieae**

Certain records have been omitted on the grounds of imponderability. An example is the organism(s) referred to by Viero y Clavijo (548) under the name *Bellaria Lapidea Canariensis*. Martin Aguado (386), in analysing the treatments of algae by Viero y Clavijo (548), concluded that melobesiods were being referred to in this entry, otherwise headed ‘Confites’, but that it was not possible to be more precise than ‘subfamilia Melobesieae’.

**Melobesia** Lamouroux

The concept of *Melobesia* adopted in this paper follows Woelkerling (1988: 186–191), who also provides information on the nomenclatural and taxonomic history of the genus. Many species that at some stage were ascribed to *Melobesia* are now placed in other genera.

**Melobesia amplexifrons** Harvey

See *Pneophyllum amplexifrons*.

**Melobesia brassica-florida** Harvey

See note to *Neogoniolithon brassica-florida* (Harvey) Setchell & Mason.

**Melobesia callithamnioides sensu** Falkenberg

See references for *Melobesia callithamnioides* under *Fosliella farinosa* (Lamouroux) Howe.

*Note.* Chamberlain (1983: 351–352) provided a detailed historical account of *Melobesia callithamnioides sensu* Falkenberg and concluded that *Melobesia callithamnioides sensu* Falkenberg was conspecific with *Fosliella farinosa* (Lamouroux) Howe [= *Hydrolithon farinosum* (Lamouroux) Penrose & Chamberlain]; see Penrose & Chamberlain, 1993], where she treated it as a distinct variety under the name *Fosliella farinosa f. callithamnioides* (Foslie) Chamberlain. Chamberlain (1983: 352), however, was unable to confirm this placement by comparative examination of type material and indeed did not designate a lectotype. Until a lectotype is designated and studied in detail in a modern context, the status and disposition of *Fosliella farinosa f. callithamnioides* (Foslie) Chamberlain will remain uncertain, as will records of this taxon from the West African region.

**Melobesia confervicola** (Kützing) Foslie

See *Pneophyllum confervicolum* (Kützing) Chamberlain.

**Melobesia confinis** P. & H. Crouan

See *Lythophyllum pustulatum* (Lamouroux) Foslie.

**Melobesia corallinae** P. & H. Crouan

See *Lithophyllum corallinae* (P. & H. Crouan) Heydrich.

**Melobesia corticiformis** Kützing

See *Melobesia membranacea* (Esper) Lamouroux.

**Melobesia cystoseirae** Hauck

See *Lithophyllum cystoseirae* (Hauck) Heydrich.

**Melobesia farinacea** Lamouroux

See *Fosliella farinosa* (Lamouroux) Howe.

*Note.* Based on a comparative study of relevant type and other collections, Penrose & Chamberlain (1993) have concluded that the genus *Fosliella*, which is typified by *F. farinosa*, is a heterotypic synonym of *Hydrolithon*, and they have transferred Lamouroux's species to that genus, as *Hydrolithon farinosum* (Lamouroux) Penrose & Chamberlain.

**Melobesia farinosa** Lamouroux

See *Fosliella farinosa* (Lamouroux) Howe and note under *Melobesia farinacea* Lamouroux.

**Melobesia lejolissii** Rosanoff

See *Pneophyllum lejolissii* (Rosanoff) Y. Chamberlain.

**Melobesia mamillaris** Harvey

See *Neogoniolithon mamillare* (Hauck) Setchell & Mason.

**Melobesia membranacea** (Esper) Lamouroux

Canaries (191;227;232B;439;441;582;584;598;633;634).

Cape Verde Islands (408;598).

Mauritanie (252;349;439;441).

Salvage Islands (598).

‘. . . régions tempérées et chaudes de l’Atlantique. . .’ (188).

‘Subtropical Africa [Senegal(N. of Gambia); Mauritania; Former W. Sahara]’ (598).

[As *Melobesia membranacea* (Esper) Foslie]

Cape Verde Islands (408).

[As *Melobesia membranacea* Lamouroux]

Cape Verde Islands (38).

Congo (249;250).

[As *Melobesia corticiformis* Kützing]

Canaries (547).

Cape Verde Islands (41;42).

[As *Epilithon membranaceum* (Esper) Heydrich]

Angola (541).

Canaries (70;314;354;356;359;362;363;517;624).

Cape Verde Islands (366).

Congo (356).

Mauritanie (356;359).

Salvage Islands (38B;231;375).

Sénégal (356).

‘. . . optima verio in mari atlantico ab oris Norvegiae usque ad promontorium Cap b. spei. . .’ (25).

‘. . . régions tempérées et chaudes de l’Atlantique. . .’ (355).

[As *Lithothamnion membranaceum* (Esper) Foslie]

Cape Verde Islands (252).

Mauritanie (252).

Sénégal (252).

‘. . . in oceano Atlantico ab oris Norvegiae usque ad promontorium Capitis Bonae Spei Africae australis. . .’ (134).

‘Nordwestafrika’ (499).

*Note.* This species originally was described as *Corallina membranacea* Esper (1806: Corallina Tab. XII). Esper (1806) did not indicate the locality from which his material came, but subsequently (1830: 363, as *Melobesia*) stated that the species occurred on the western shores of France and probably in other regions. Lamouroux (1812: 186) transferred the species to his new genus *Melobesia*, and as noted by Mason (1953: 319), Chamberlain (1985: 673) and Woelkerling (1988: 189), *M. membranacea* (Esper) Lamouroux must be considered the type species of *Melobesia*. The species also has been placed in *Epilithon* (Heydrich, 1897a: 408) and in *Lithothamnion* (681: 7). Chamberlain (1985) neotypified the species with a Lamouroux specimen (CN); accounts of the neotype are provided by Chamberlain (1985) and Wilks & Woelkerling (1991), the latter in conjunction with a monographic account of southern Australian species of *Melobesia*. Specimens on which published records for the West African region are based now need to be checked to determine whether they are conspecific with the neotype. Chamberlain (1983: 300, 306) concluded from studies of the type of *Melobesia corticiformis* Kützing that it was a heterotypic synonym of *Melobesia membranacea*. References to *Melobesia corticiformis* above are based on comments of Lemoine (363: 29) who indicated that these specimens were misidentified plants of *M. membranacea* (as *Epilithon*).

**Melobesia minutula** Foslie

See *Pneophyllum confervicolum* (Kützing) Y. Chamberlain.

**Melobesia pustulata** Lamouroux

See *Lithophyllum pustulatum* (Lamouroux) Foslie.

**Melobesia sauvageauii** Foslie

See *Lithoporella sauvageaui* (Foslie) Adey.

**Melobesia solmsiana** Falkenberg

See references for *Melobesia solmsiana* under *Fosliella farinosa* (Lamouroux) Howe.

*Note.* Chamberlain (1983: 351–352) concluded that *Melobesia solmsiana* Falkenberg was conspecific with *Fosliella farinosa* (Lamouroux) Howe [= *Hydrolithon farinosum* (Lamouroux) Penrose & Chamberlain; see Penrose & Chamberlain, 1993] and treated it as a distinct form under the name *Fosliella farinosa* f. *callithamnioides* (Foslie) Chamberlain. Chamberlain (1983: 352), however, was unable to confirm this placement by comparative examination of type material and indeed did not designate a lectotype. Until a lectotype is chosen and studied in detail in a modern context, the status and disposition of *Melobesia solmsiana* Falkenberg and *Fosliella farinosa* f. *callithamnioides* (Foslie) Chamberlain will remain uncertain, as will records of this taxon from the West African region.

**Melobesia solmsii** Bornet ex Lemoine

Canaries (356).

*Note.* *Melobesia solmsii* is an herbarium name of Bornet that was first published by Lemoine (354: LXIV), who suggested that Bornet's plants were the same as plants identified by Falkenberg as *Melobesia callithamnioides*. Subsequently, Lemoine (356: 26) recorded *Melobesia solmsii* from various regions, including the Canary Islands. The Canary Islands record was listed in Price et al. (1986: 92) under their entry for *Fosliella farinosa*. The nomenclatural history of *Melobesia callithamnioides* sensu Falkenberg (1879) has been summarized by Chamberlain (1983: 352), who noted that Falkenberg (179: 109) subsequently described his material as a new species, *Melobesia*



*solmsiana*. Given these facts, *Melobesia solmsii* Bornet ex Lemoine must be interpreted as a homotypic synonym of *Melobesia solmsiana* Falkenberg. Chamberlain (1983: 351–352) concluded that *Melobesia solmsiana* Falkenberg was conspecific with *Fosliella farinosa* (Lamouroux) Howe [= *Hydrolithon farinosum* (Lamouroux) Penrose & Chamberlain]; see Penrose & Chamberlain, 1993] and treated it as a distinct variety under the name *Fosliella farinosa* f. *callithamnoides* (Foslie) Chamberlain. Chamberlain (1983: 352), however, was unable to confirm this placement by comparative examination of type material and indeed did not designate a lectotype. Until a lectotype is chosen and studied in detail in a modern context, the status and disposition of *Melobesia solmsiana* Falkenberg (including *M. solmsii* Bornet ex Lemoine) and *Fosliella farinosa* f. *callithamnoides* (Foslie) Chamberlain will remain uncertain, as will records of this taxon from the West African region.

### ***Melobesia stictaeformis* Areschoug**

Salvage Islands (439).

*Note.* Areschoug (1852: 517) based this species on a collection from the Mediterranean. A detailed study of the type (presumably in LD), however, has not been undertaken in a modern context, and thus the status and disposition of this species are uncertain, as is the record from the Salvage Islands.

### ***Meredithia microphylla* (J. Agardh) J. Agardh**

Canaries (227;598;661).

Cape Verde Islands (598).

[As *Callymenia microphylla* J. Agardh]

Canaries (70;177).

[As *Callymenia* (*Meredithia*) *microphylla* J. Agardh]

Canaries (493).

[As *Callymenia reniformis* (Turner) J. Agardh]

Canaries (547).

[As *Kallymenia microphylla* J. Agardh]

Canaries (191;273;392;584).

Cape Verde Islands (37).

*Note.* For background data on this species, see Guiry & Maggs (661). See note under *Kallymenia microphylla* J. Agardh in Price et al. (1992).

### ***Meristiella echinocarpa* (Areschoug) Cheney & Gabrielson**

[As *Meristotheca?* *decumbens* Grunow in Piccone]

Cape Verde Islands (439).

[As *Rhabdonia decumbens* (Grunow) Grunow in Askenasy]

Cape Verde Islands (37)

[As *Mychodea schrammii* P. & H. Crouan]

Cape Verde Islands (38;450;451).

*Note.* Prud'homme van Reine et al (663) have re-investigated the Macaronesian algae studied by Piccone (see 439,450,451) and Grunow (see 37,38) and concluded that Askenasy had in error identified both *Meristiella echinocarpa* (from the Cape Verde Islands) and *Meristotheca?* *decumbens* (from Madeira, the Canaries and also from the Cape Verde Islands) as *Mychodea schrammii*. The specimens collected by Naumann (450, 451) have not been studied in detail by Prud'homme van Reine et al. (663).

### ***Meristiella schrammii* (P. & H. Crouan) Cheney & Gabrielson**

See *Meristiella echinocarpa* (Areschoug) Cheney & Gabrielson.

### ***Meristotheca coacta* Okamura**

Ghana (299).

*Note.* See under *Halichrysis depressa* (J. Agardh) Schousboe in Bornet for the validity of this record based on sterile plants.

### ***Meristotheca?* *decumbens* Grunow in Piccone**

Canaries (439)

Cape Verde Islands (439;450;451).

*Note.* See note under *Meristiella echinocarpa* (Areschoug) Cheney & Gabrielson.

### ***Meristotheca duchassaingii* J. Agardh**

See *Halymenia duchassaingii* (J. Agardh) Kylin.

### ***Meristotheca senegalense* J. Feldmann [mscr.]**

Sénégal (529;531).

[As *Meristotheca senegalensis* J. Feldmann]

Senegal (59;398).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania;

Former W. Sahara]' (598).

[As *Sarcodia ceylanica* Harvey]

Sénégal (122).

*Note.* According to Mollion (398) this is a manuscript name. Prior to this, Sourie (529: 116) had noted '... espèce nommée, mais encore non décrite par J. Feldmann'.

### ***Meristotheca* sp.**

Gabon (294).

Sénégal (529).

*Note.* For comments on validity of Gabon record, see note to *Halichrysis depressa* (J. Agardh) Schousboe in Bornet.

### ***Mesophyllum***

The concept of *Mesophyllum* adopted in this paper follows Woelkerling & Harvey (1993), who provide an updated description of the genus taking into account new data on spermatangial conceptacles (Woelkerling & Harvey, 1992). Additional nomenclatural and systematic data on *Mesophyllum* are provided by Woelkerling & Irvine (1986b) and Woelkerling (1988: 191–196)

### ***Mesophyllum applicatum* Lemoine**

See *Neogoniolithon hirtum* (Lemoine in Børgesen) Afonso-Carrillo.

### ***Mesophyllum brachycladum* (Foslie) Adey**

Canaries (598).

Príncipe (350;535;586).

St. Helena (535).

'... in warm temperate and tropical parts of the eastern Atlantic Ocean. . .' (350;586).

'Tropical Africa (N. Gambia – Congo river)' (598).

[As *Lithothamnion brachycladum* Foslie]

Angola (541;634).

Canaries (6;134;198;354;356;634)

Príncipe (134;363).

St. Helena (6;134;198;212;634;655).

'... West Coast of Africa. . .' (208).

'... probably nearly all along the west coast of Africa' (198).

[As *Lithothamnion racemus* (Lamouroux) Foslie]  
Canaries (547).

St. Helena (142;391).

*Note.* This species originally was described as *Lithothamnion brachycladium* (198: 3) and is based on material from St. Helena. Subsequently, Adey (669: 22) transferred the species to *Mesophyllum*, expressing some doubt about this placement. The holotype (678: 42–43) has not been examined in detail in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. In the protologue, Foslie (198: 3) suggested that the holotype of *Lithothamnion brachycladium* is probably the same specimen that Dickie (142: 179) referred to *Lithothamnion racemus*, and thus the same specimen on which the record of Mellis (391: 382) is based. Although the Dickie and Mellis records are included under *brachycladium*, Foslie's suggestion requires confirmation. Lemoine (354: LIV) noted that a Canary Islands specimen in the Thuret herbarium under the name *Lithothamnion branchycladium* had been determined by Foslie as *Lithophyllum racemus*.

### **Mesophyllum canariense (Foslie) Lemoine in Børgesen**

Canaries (191;362;363;375;489;493;535;582;598).

São Tomé (350;535;586).

'Gulf of Guinea' (582).

'Tropical Africa (N. Gambia – Congo river)' (598).

'... widespread in warm temperate and tropical seas. . .'  
(350;586).

[As *Lithophyllum marlothii* Heydrich]

São Tomé (6;251;265).

[As *Lithophyllum Marlothii* Heydrich forma Foslie]

São Tomé (251).

[As *Lithothamnion canariense* Foslie]

Canaries (6;139;205;212;493;660).

[As *Lithothamnion canaricae* Foslie]

Canaries (387).

[As *Mesophyllum canariense* (Foslie) Lemoine]

Canaries (191;227;361;687).

[As *Mesophyllum canariensis* (Foslie) Lemoine]

Canaries (229).

[As *Mesophyllum canariense* (Foslie) Lemoine var. *fasciata*  
Lemoine]

Canaries (363).

[As *Mesophyllum canariense* (Foslie) Lemoine var. *difformis*  
Lemoine]

Canaries (363).

[As *Lithophyllum canariensis* ?]

Canaries (237).

*Note.* This species originally was described as *Lithothamnion canariense* (205: 17) and is based on material from Puerto Orotava, Tenerife, Canary Islands. Lemoine (363: 31) subsequently transferred the species into *Mesophyllum*. The holotype (678: 46) has recently been studied in a modern context by Reyes & Afonso-Carrillo (687), who state that it certainly belongs to the genus *Mesophyllum* as delineated by Woelkerling & Irvine (1986b). The identification of specimens from much of the West African region remains uncertain. Both *Mesophyllum canariense* var. *difformis* Lemoine (363: 33) and *Mesophyllum canariense* var. *fasciata* Lemoine (363: 31) are based on single collections from the Canary Islands, but the holotypes have not been examined in detail in a modern context, and thus the status and disposition of these varieties are also uncertain. According to Steentoft (535: 130), specimens from São Tomé referred to *Lithophyllum marlothii* by Hariot (251: 164) and Henriques (265: 166) are considered by Lemoine to belong to *Mesophyllum canariense*. Similarly, Adey & Lebednik (6: 19) indicate that one specimen listed under *Lithophyllum marlothii* really belongs to *Mesophyllum canariense*. These specimens need to be

re-examined to determine whether they are conspecific with the holotype of *Mesophyllum canariense*. Gonzalez (237: Table II) lists a *Lythophyllum canariensis* from the Canary Islands without further taxonomic or nomenclatural comments. It is presumed here that Gonzalez is referring to *Mesophyllum canariense*. As far as can be determined, the binomial *Lithophyllum canariensis* has never been validly published.

### **Mesophyllum ectocarpon (Foslie) Adey**

Canaries (17;598;634).

Cape Verde Islands (366;597;598).

Mauritanie (349;597).

Sénégal (366).

'Makaronesische Inseln, Nordwest und West-Afrika' (597).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; former W. Sahara]' (598).

[As *Lithothamnion ectocarpon* Foslie]

Canaries (136;191;227;362;363;366).

Cape Verde Islands (6;136;139;207;210;362;363;366).

Mauritanie (6;139;207;210;212;362;363;366).

'Vestkysten af Afrika: Kap Blanco . . . og St. Vincent' (207).

Sénégal (6).

*Note.* This species was originally described as *Lithothamnion ectocarpon* Foslie (207: 11) based on specimens from the Cape Verde Islands and Cap Blanc, Africa. Adey (in 6: 83) lectotypified the species with the Cap Blanc collection and subsequently (669: 23) transferred it to *Mesophyllum* with some question. The lectotype (678: 82) has not been studied in detail in a modern context, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region.

### **Mesophyllum erubescens (Foslie) Lemoine**

Canaries (366).

Cape Verde Islands (100;101;366;598).

'Pantropical' (366).

*Note.* This species was originally described as *Lithothamnion erubescens* (198: 9) and is based on material from Brazil. Lemoine (361: 252) transferred the species into *Mesophyllum* without comment. The holotype (678: 85) has not been studied in detail in a modern context and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. Afonso-Carrillo et al. (582) commented that despite previous references to the taxon from the Canary Islands, its presence there is doubtful and requires confirmation.

### **Mesophyllum floridanum (Foslie) Adey**

São Tomé (350;586).

[As *Lithothamnion floridanum* Foslie]

São Tomé (6;139;204;535).

*Note.* This species was originally described as *Lithothamnion floridanum* (204: 11) and was based on material from Florida. In the protologue, Foslie (204: 12) also mentions two sterile specimens from São Tomé which resemble *Lithothamnion floridanum* but cannot be definitely identified to species. The holotype (678: 96) has not been studied in detail in a modern context and thus the status and disposition of the species are uncertain, as is the identification of specimens from São Tomé.

### **Mesophyllum lichenoides (Ellis) Lemoine**

Canaries (188;191;227;232B;361;363;517;546;582;584;598;  
633;666).

Mauritanie (649).

'... Atlántico (de Gran Bretaña a Marruecos y Canarias)'  
(517).



‘. . . Atlantique (de l’Angleterre à la Mauritanie, Canaries)’ (33).

‘. . . Atlantique jusqu’au Rio de Oro. . .’ (222).

[As *Lithophyllum lichenoides* (Linnaeus) Lemoine] Mauritania (349).

Western Sahara (349).

[As *Lithophyllum lichenoides* Philippi]

Canaries (70;527).

[As *Lithophyllum expansum* Philippi]

Canaries (356;448;584).

Salvage Islands (89).

‘Cap Blanc’ (356).

[As *Lithophyllum expansum* Philippi f. *involvens* Vinassa] Mauritania (211).

[As *Lithophyllum expansum* Philippi f. *strictaeformis* (Areschoug) Foslie]

Salvage Islands (215).

[As *Lithophyllum expansum* Philippi f. *exigua* Foslie]

‘Cap Blanc’ (252).

[As *Pseudolithophyllum expansum* (Philippi) Lemoine]

Canaries (18;70;177;221;227;598).

Mauritania (70;177;188;221;248;349;359;365).

Salvage Islands (38B;598)

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

‘. . . existe aussi sur les côtes atlantique d’Espagne et sur les côtes d’Afrique jusqu’an Sénégal . . .’ (365).

*Note.* This species originally was described as *Corallium lichenoides* (Ellis, 1768: 407) and was probably based on material from Cornwall, England. The subsequent taxonomic and nomenclatural history of *Mesophyllum lichenoides* is outlined by Woelkerling & Irvine (1986b), who neotypified the species with plants from West Looe, Cornwall, England and provided a detailed account of the neotype material and the species. Additional data on *M. lichenoides* are provided by Woelkerling & Harvey (1992, 1993) in conjunction with studies of southern Australian species of *Mesophyllum*. Specimens on which published records for the West African region are based now need to be checked to determine whether they are conspecific with the neotype. The lectotype of *Lithophyllum expansum* Philippi has been examined in detail by Woelkerling (1983b: 307–313) who concluded that the lectotype belonged to *Mesophyllum* as delimited by Johansen (1976, 1981) and Cabioch (1972) and that circumstantial evidence suggested that the lectotype was conspecific with *Mesophyllum lichenoides*. Woelkerling (1983b: 312) also noted that Philippi’s epithet *expansum* has been widely misapplied to plants referable to *Lithophyllum*. Thus all specimens from the West African region identified as *Lithophyllum expansum* or *Pseudolithophyllum expansum* need to be re-examined to determine whether they belong to the Lithophylloideae or the Melobesioideae and then to determine their true generic and specific identity. It is likely that many of these plants belong to *Lithophyllum* rather than *Mesophyllum*. This also applies to specimens identified as *Lithophyllum expansum* Philippi f. *exigua* Foslie (197: 3), *Lithophyllum expansum* Philippi f. *involvens* Vinassa (1892: 59), and *Lithophyllum expansum* Philippi f. *strictaeformis* (Areschoug) Foslie (199: 18) [Basionym: *Melobesia strictaeformis* Areschoug, 1852: 517]. The types of these formae also need to be re-examined in a modern context to determine their status and disposition. Data on the types of *Lithophyllum expansum* Philippi f. *exigua* Foslie and *Melobesia strictaeformis* Areschoug are provided by Woelkerling (678: 88, 207); the whereabouts of the type of *Lithophyllum expansum* Philippi f. *involvens* Vinassa is uncertain. See note under entry for *Lithophyllum lobatum* concerning Sauvageau’s (493) and Foslie’s (211) record of ‘*Lithophyllum expansum*’ from the Canaries.

### **Mesophyllum lobatum** Lemoine

See *Lithophyllum lobatum* Lemoine in Børgesen.

### **Mesophyllum philippii** (Foslie) Lemoine

See *Lithothamnion philippii* Foslie.

### **Mesophyllum solutum** (Foslie) Lemoine, nomen invalidum

See *Lithothamnion solutum* (Foslie) Foslie.

### **Mesophyllum** sp.

Canaries (229;237).

Cape Verde Islands (366).

*Note.* Lemoine (366: 236) indicated: ‘. . . deux espèces indéterminées, un *Lithothamnion* et un *Mesophyllum* ce dernier appartient peut-être à une espèce non décrite des Canaries’.

### **Mesothamnion caribaeum** Børgesen

See *Pleonosporium caribaeum* (Børgesen) R. Norris.

### **Microcladia capensis** (Kützinger) Papenfuss

See the note to *Ceramium capense* Kützinger.

### **Microcladia glandulosa** (Solander ex Turner) Greville

Gambia (296).

Sénégal (133).

Senegambia (296).

‘. . . ad litus Senegambiae. . .’ (318).

[As *Microcladia glandulosa* Greville]

Sénégal (283).

[As *Microcladia tenuis* Kützinger]

‘Gabon, Guinea’ (149).

‘Embouchure de la rivière de Gabon, Guinée’ (321).

### **Microcladia tenuis** Kützinger

See *Microcladia glandulosa* (Solander ex Turner) Greville.

### **Micropeuce mucronata** (Harvey) Kylin

Ghana (350;376;377;586).

‘. . . probably widespread in many warm temperate and tropical seas’ (350;586).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

### **Monospora furcellata** auctorum

See *Griffithsia arachnoides* C. Agardh.

### **Monospora pedicillata** Solier in Castagne

See *Monosporus pedicillatus* (J. E. Smith) Solier in Castagne.

**Monosporus pedicillatus** (J.E. Smith) Solier in Castagne

Canaries (71;633;668;684).

[As *Monospora pedicellata* Solier]

Canaries (547).

[As *Corynospora pedicellata* (J.E. Smith) J. Agardh]

Canaries (13;38D;227;375;547;556;584).

Salvage Islands (38B;38D;556).

[As *Neomonospora pedicillata* (Smith) G. Feldmann & Meslin]

Canaries (191).

‘. . . Atlantique (de l’Angleterre aux Canaries). . .’ (33).

‘. . . Atlantique nord: de la Grande-Bretagne jusqu’aux Canaries. . .’ (222).

‘. . . Atlantique nord, de l’Angleterre aux Canaries. . .’ (190).

‘. . . Atlantique nord, de Grande Bretagne aux Canaries. . .’ (196).

[As *Neomonospora furcellata* (J. Agardh) G. Feldmann & Meslin]

Canaries (191).

**Murrayella periclados** (C. Agardh) Schmitz

Angola (298;347A;352;458;466).

Bioko (346;350;586).

Cameroun (337;350;460;463;535;537;586).

Congo (535).

Gabon (458;471).

Gambia (296;350;586).

Ghana (153;336;337;338;342;344;350;458;460;463;464;466;473;535;586).

Guinée (350;460;535;586).

São Tomé (350;458;466;470;473;535;586).

Sierra Leone (30;295;336;339;344;350;374;378;458;460;464;466;468;470;473;535;586).

‘. . . present in many parts of West Africa. . .’ (347A).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

‘West Africa’ (290).

‘. . . widespread in warm temperate and tropical seas. . .’ (350;586).

*Note.* Post’s (458) Angola record is based on her redetermination of Welwitsch no. 60 (BM), from Cabo Lombo, Loanda, under the manuscript name of *Ceramium arachnoideum* Welwitsch (q.v.). The record (460) from Cameroun does *not* relate to Post’s comments (458: 79) in redetermining ‘*Bostrychia periclados*’ as *Bostrychia moritziana* (Sonder ex Kützing) J. Agardh (q.v.), rather than *Murrayella periclados*. Records from Gabon are said (458; 471: 150) to be from ‘süßwasser’ but are included for completeness.

**Murrayella** sp.

Sierra Leone (460).

**Mychodea schrammii** P. & H. Crouan

See *Meristiella echinocarpa* (Areschoug) Cheney & Gabrielson.

**Myriogramme costata** P. Dangeard

Sénégal (89;122;221).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

*Note.* See *Nitophyllum dentatum* for doubt concerning the separation of the genus *Myriogramme* from *Nitophyllum*.

**Myriogramme dentata** (Schousboe) nomen nudum

Sénégal (529).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

*Note.* Combination has not been validly proposed. The relationship between this taxon and *Nitophyllum dentatum* Bornet (q.v.) requires further investigation.

**Myriogramme minuta** Kylin

Canaries (633;634;648).

**Myriogramme** sp.

Sénégal (55;56).

**Naccaria corymbosa** J. Agardh

Salvage Islands (38B;598).

*Note.* See Searles & Leister (1980) concerning former known geographical distribution only in North America.

**Naccaria** sp.

Canaries (227).

**Nemalion amoenum** (Pilger) Børgesen

Cameroun (80;281;350;433;586).

‘Tropical Africa (Gambia – Congo river)’ (598).

[As *Dermonema amoenum* Pilger]

Cameroun (139;433;454).

*Note.* See discussion in Børgesen (80: 26–27) for placing *Dermonema* in the genus *Nemalion* which he does with some doubt, stating (p. 27) ‘final decision as to its real place can of course not be taken before its female organs are found, nevertheless I think that at present its right place is in the genus *Nemalion*’.

**Nemalion helminthoides** (Velley in Withering) Batters

Canaries (18;226;227;232B;253;583;584;598;633;634).

Western Sahara (349;476;659).

‘. . . Atlantico norte de Inglaterra y Norvega a Marruecos. . .’ (517).

‘. . . Atlántico (Norvega – Canaries). . .’ (253).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

[As *Nemalion multifidum* (Weber & Mohr) J. Agardh]

Canaries (254;305).

[As *Nemalion heminthoides*]

Canaries (237).

[As *Nemalion lubricum* Duby]

‘. . . Atlantischer Ozean: Nordwest-africanische Küste. . .’ (499).

**Nemalion lubricum** Duby

See *Nemalion helminthoides* (Velley) Batters.



**Nemalion multifidum** (Weber & Mohr) J. Agardh

‘. . . in oceano atlantico a littore Norvegiae usque ad Canarias (Webb.). . .’ (25).

*Note.* Feldmann (188) considers the possibility that this species is a mere growth form of *N. helminthoides* (Velley) Batters.

**Nemalion** sp.

Canaries (70).

**Nemastoma canariensis** (Kützinger) J. Agardh

Canaries (13;38C;70;89;134;191;227;232B;315;540;598;662).

[As *Gymnophloea canariensis* Kützinger]

Canaries (24;318).

[As *Halymenia capensis* Montagne]

Canaries (401).

[As *Nemastoma canariensis* J. Agardh]

Canaries (547).

[As *Nemastoma canariensis* (Kützinger) Montagne]

Canaries (139;390;407).

[As *Nemastoma canariense* (Kützinger) Montagne]

Canaries (633;634).

*Note.* The comments under *Nemastoma confusum* probably also apply equally to this species.

**Nemastoma confusum** Kraft & D. John

Cape Verde Islands (652;683).

Ghana (299;315;350;376;586).

‘Tropical Africa (N. Gambia – Congo river)’ (598).

‘. . . tropical West Africa’ (350;586).

*Note.* Athanasiadis (630) has reassessed the genus *Nemastoma* based on a study of the type species (*N. dichotomum*) and proposed a new generic circumscription. Many species traditionally placed in *Nemastoma* cannot now be accommodated. Athanasiadis comments thus (p. 31) ‘Others, like *Nemastoma confusum* Kraft et John (1976), which should apparently be excluded, necessitate a better knowledge of the related genera in order to be transferred to the taxon where they actually belong’.

**Nemastoma multifida** J. Agardh

See *Platoma cyclocolpum* (Montagne) Schmitz.

**Nemastoma** sp.

Cape Verde Islands (652).

**Neogoniolithon**

The concept of *Neogoniolithon* adopted in this paper follows Penrose (1992), who studied the type species, *N. fosliei*, and used the following combination of features to delimit *Neogoniolithon* from other genera of the subfamily Mastophoroideae: 1) thallus non-endophytic and lacking haustoria; 2) thallus lacking a vertical layer of filaments composed of palisade cells; 3) spermatangia simple and borne on the floor and roof of male conceptacle chambers; and 4) gonimoblast filaments arising dorsally from fusion cells. Tetrasporangial conceptacle ontogeny in *Neogoniolithon* (Penrose, 1992: 342) is similar to that in *Spongites* (Penrose, 1991). A revised key to the genera of Mastophoroideae, including *Neogoniolithon*, is provided by Penrose & Chamberlain (1993: 303). Additional nomenclatural and systematic data on *Neogoniolithon* are provided by Woelkerling (1988: 139–145).

**Neogoniolithon absimile** (Foslie & Howe) Cabioch

See *Spongites wildpretii* Afonso-Carrillo.

**Neogoniolithon accretum** (Foslie & Howe) Setchell & Mason

Canaries (227;582).

[As *Neogoniolithon accretum* Foslie & Howe f. *canariense* (Foslie) De Toni]

Canaries (139;205;212;382;493).

[As *Lithophyllum accretum* (Foslie & Howe) Lemoine]

Canaries (71;362;363;493).

[As *Lithophyllum accretum* (Foslie & Howe) Lemoine]

Canaries (71;362;363;493).

[As *Lithophyllum accretum* (Foslie & Howe) Lemoine f. *canariensis* Foslie]

Canaries (205).

[As *Lithophyllum accretum* (Foslie & Howe) Lemoine var. *canariense* (Foslie) Lemoine]

Canaries (191;363).

*Note.* This species originally was described as *Goniolithon accretum* (Foslie & Howe, 1906: 131) and is based on material from Sands Key, Florida. Subsequently, the species was transferred to *Lithophyllum* (357: 159) and then to *Neogoniolithon* (Setchell & Mason, 1943: 90). The holotype (678: 16) has not been studied in detail in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of specimens from the West African region. Foslie (205: 19) also described *Lithophyllum accretum* f. *canariensis* Foslie based on material from Puerto Orotava, Tenerife, Canary Islands. This form apparently has not been transferred into *Neogoniolithon*.

**Neogoniolithon brassica-florida** (Harvey) Setchell & Mason

[As *Lithothamnion brassica-florida* (Harvey) Areschoug]

St. Helena (142;260;391).

[As *Lithothamnion brassica-florida* Harvey var.]

St. Helena (391).

*Note.* This species originally was described as *Melobesia brassica-florida* Harvey (1849: 110) and is based on material from Algoa Bay, South Africa. Subsequently, the species was transferred to *Lithothamnion* (Areschoug, 1852: 523), then to *Goniolithon* (681: 9) and then to *Neogoniolithon* (Setchell & Mason, 1943: 91). The lectotype (678: 43) has been studied in detail by Woelkerling et al. (1993), who confirmed that this species belonged to *Neogoniolithon* as circumscribed by Penrose (1992). Woelkerling, Penrose & Chamberlain (1993) also concluded that *N. fosliei* (Heydrich) Setchell & Mason, the type species of *Neogoniolithon*, was a heterotypic synonym of *N. brassica-florida*. The specimens from St. Helena now need to be re-examined to determine whether they are conspecific with the lectotype of *N. brassica-florida*.

**Neogoniolithon caribaeum** (Foslie) Adey

Canaries (227;582;598).

Cape Verde Islands (598).

[As *Lithophyllum caribaeum* Foslie]

Canaries (71;191;362;363;366).

Cape Verde Islands (366).

[As *Lithophyllum* (?) *cariboeum* Foslie]

Cape Verde Islands (100).

*Note.* This species was originally described as *Lithophyllum decipiens* Foslie (204: 18) based on material from the US Virgin Islands. Subsequently, Foslie (206: 22) raised it to species status as *Lithophyllum caribaeum*, and Adey (669: 8) transferred it to *Neogo-*

*niolithon*. There has been no detailed study of the lectotype collection (678: 48) in a modern context, and thus the status and disposition of this species are uncertain, as is the identification of specimens from the West African region.

**Neogoniolithon hirtum** (Lemoine in Børgesen)  
Afonso-Carrillo

Canaries (11;582;598;633;634).

[As *Lithophyllum applicatum* Lemoine]

Canaries (227;362;363).

[As *Mesophyllum applicatum* Lemoine]

Canaries (191;687).

[As *Lithophyllum hirtum* Lemoine in Børgesen]

Canaries (227;362;363;687).

[As *Tenarea adhaerens* Lemoine in Børgesen]

Canaries (191;227;362;363).

*Note.* Based on studies of the original Canary Islands collections of Lemoine, Afonso-Carrillo (11: 131) concluded that *Lithophyllum hirtum* Lemoine in Børgesen (363: 37) belonged to *Neogoniolithon* (sensu Cabioch, 1972) and that *Lithophyllum applicatum* Lemoine in Børgesen (363: 38) and *Tenarea adhaerens* Lemoine in Børgesen (363: 59) were heterotypic synonyms. These conclusions need to be re-evaluated in light of the revised concept of *Neogoniolithon* presented by Penrose (1992). Afonso-Carrillo (11) did not present detailed accounts of the type collections, and it is not clear whether the species involved possess the features now considered diagnostic of *Neogoniolithon*. Lemoine (363: 37, 38) based *Lithophyllum hirtum* on two collections and *L. applicatum* on five collections, but neither she nor Afonso-Carrillo (11) specified types. Until lectotypes are chosen and examined in detail in a modern context, the status and disposition of these species will remain uncertain, as will the identification of specimens from the West African region. Feldmann (191: 413) used the binomial *Mesophyllum applicatum* Lemoine instead of *Lithophyllum applicatum* Lemoine. It is not clear whether this is an error or whether Feldmann had intended to transfer *applicatum* to *Mesophyllum*; the binomial probably should be cited as *Mesophyllum applicatum* (Lemoine) Lemoine ex J. Feldmann.

**Neogoniolithon illitus** (Lemoine in Børgesen)  
Afonso-Carrillo

Canaries (11;582;598).

Cape Verde Islands (582;598).

[As *Lithophyllum illitus* Lemoine in Børgesen]

Canaries (191;227;362;363;366;687).

Cape Verde Islands (100;366;645).

*Note.* Based on studies of the original Canary Islands collections of Lemoine, Afonso-Carrillo (11: 131) concluded that *Lithophyllum illitus* Lemoine in Børgesen (363: 37) belonged to *Neogoniolithon*. This conclusion needs to be re-evaluated in light of the revised concept of *Neogoniolithon* presented by Penrose (1992). Afonso-Carrillo (11) did not present detailed accounts of Lemoine's original collections, and it is not clear whether the species possesses the features now considered diagnostic of *Neogoniolithon*. Lemoine (363: 54) based this species on 14 collections obtained from several localities, but neither she nor Afonso-Carrillo (11) specified a type. Until a lectotype is chosen and examined in detail, the status and disposition of this species will remain uncertain, as will records from the West African region. The record in Feldmann (183: 1071) is given with a query.

**Neogoniolithon mamillare** (Harvey) Setchell & Mason

Annobón (366).

Bioko (350;586).

Cameroun (350;586).

Cape Verde Islands (366;598).

St. Helena (655).

'Pantropical' (350;366;586).

'Tropical Africa (N. Gambia – Congo river)' (598).

[As *Goniolithon mamillare* (Harvey) Foslie]

Annobón (397;455;457;500).

Bioko (500).

Cameroun (500).

'... ad littora Africae ad Caput Verde. . .' (134).

[As *Goniolithon mamillaris*]

Cape Verde Islands (BM Herbarium, Coralline Catalogue).

[As *Lithothamnion brassica-florida* Harvey]

St. Helena (142;259;391).

[As *Lithothamnion mamillare* Harvey]

Cape Verde Islands (145).

[As *Lithothamnion mamillare* (Harvey) Areschoug]

Cape Verde Islands (38).

[As *Melobesia mamillaris* Harvey]

Cape Verde Islands (254;366).

[As *Porolithon mamillare* (Harvey) Foslie]

Annobón (139).

Cape Verde Islands (139;357).

Sénégal (357).

*Note.* This species was originally described as *Melobesia mamillaris* Harvey (1849: 109). Subsequently, the species has been transferred to *Lithothamnion* (Areschoug, 1852: 521), *Goniolithon* (681: 9), *Porolithon* (357: 177), and *Neogoniolithon* (Setchell & Mason, 1943: 91). Harvey based the species on material from Brazil, Tierra del Fuego, South Africa and the Cape Verde Islands, but did not specify a type. Printz (212: pl. 47, legend to fig. 15), however, lectotypified the species with a Brazilian specimen. According to Woelkerling (678: 144) and Porter (1987: 200), this specimen appears to be missing both from TRH and TCD, but TRH contains two syntype fragments collected at Bahia by C. Darwin. Until the lectotype can be located (or a new neotype designated) and studied in detail in a modern context, the status and disposition of this species are uncertain, as is the identification of specimens from the West African region.

**Neogoniolithon mamillosum** (Hauck) Setchell & Mason

Cape Verde Islands (366;597;598).

Mauritanie (349;366).

Sénégal (597).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W.Sahara]' (598).

[As *Goniolithon mamillare* (Harvey) Foslie]

Annobón (397;454;455;500).

Bioko (500).

Cameroun (500).

[As *Goniolithon mamillosum* (Hauck) Foslie f. *microcarpa* Foslie]

Cape Verde Islands (139;210;597).

Mauritanie (139;597).

*Note.* *Goniolithon mamillosum* f. *microcarpa* Foslie (207: 24) has been lectotypified (678: 149) with a collection from São Vicente, Cape Verde Islands, but this collection has not been studied in a modern context and thus the status and disposition of f. *microcarpa* are uncertain.

[As *Goniolithon mamillosum* (Hauck) Foslie]

Ascension (6).

Cape Verde Islands (6).

Mauritanie (6).

St. Helena (6).

Sénégal (6).



[As *Lithophyllum hauckii* (Rothpletz) Lemoine]  
Mauritanie (188;349;359)

*Note.* There has been no detailed study of the type of *Neogoniolithon mamillosum*, and thus the status and disposition of the species are uncertain, as is the identification of specimens from the West African region. The basionym of *Neogoniolithon mamillosum* (Hauck) Setchell & Mason, *Lithothamnion mamillosum* Hauck (1883: 272) is a later homonym of *Lithothamnion mamillosum* Gémblé, and this led Rothpletz (1891: 304) and then Foslie (1895: 580) to independently coin the new name *Lithothamnion hauckii* Rothpletz for Hauck's taxon (see 678: 115). In accordance with Articles 55.1 and 64.1 of the *International code for botanical nomenclature* (see Greuter, 1988), Hauck's epithet *mamillosum* is correct when used in the combination *Neogoniolithon mamillosum* (Hauck) Setchell & Mason, but because of homonymy must become *hauckii* when the species is placed in *Lithothamnion*. The type of both *Neogoniolithon mamillosum* and *Lithothamnion hauckii* is the same. In the protologue, Hauck (1883) depicted several specimens and indicated that the material came from the Adriatic without indicating specific localities. A lectotype for the species needs to be selected from amongst extant syntypes, several of which are in TRH (678: 144–145).

### ***Neogoniolithon orotavicum* (Foslie) Lemoine**

Canaries (368;583;598;633;634).

Cape Verde Islands (366;368;598).

‘. . . Golfe de Guinée’ (368).

‘Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]’ (598).

[As *Neogoniolithon orotavicum* Foslie]

Canaries (227;366).

Cape Verde Islands (366).

Sénégal (366).

[As *Neogoniolithon orotavicum* (Foslie) Lemoine ex Afonso-Carrillo]

Canaries (11;253).

Sénégal (253).

‘. . . Atlantico Oriental (Archipelagos macaronésicas y costas del Senegal). . .’ (253).

[As *Neogoniolithon orotavicum* (Foslie) Afonso-Carrillo]

Canaries (17;582).

[As *Lithophyllum orotavicum* Foslie]

Canaries (2;70;191;362).

*Note.* This species originally was described as *Goniolithon orotavicum* Foslie (205: 20) and is based on a single collection (see 678: 165) from Puerto Orotava, Tenerife, Canary Islands. Subsequently, Lemoine (363: 49) transferred the species to *Lithophyllum*, and then (366: 236, 238) to *Neogoniolithon*. Lemoine's 1964 (366) combination *Neogoniolithon orotavicum* does not conform to Article 33.2 of the *International Code of Botanical Nomenclature* with respect to basionym citation and thus is invalid. Subsequently, however, Lemoine (368: 12) properly validated the binomial, an action apparently unknown to Afonso-Carrillo (11: 133–134). Although the holotype has been examined by Adey (669: 9) and Afonso-Carrillo (11: 133–134), neither provided a detailed morphological/anatomical account of the material. Thus the status and disposition of this species in relation to Penrose's (1992) circumscription of *Neogoniolithon* are uncertain, as is the identification of specimens from the West African region.

### ***Neogoniolithon* spp.**

Canaries (10).

Cape Verde Islands (366).

São Tomé (93;350;535).

***Neomonospora furcellata* (J. Agardh) G. Feldmann & Meslin**

See *Griffithsia arachnoides* C. Agardh.

***Neomonospora pedicellata* (Smith) G. Feldmann & Meslin**

See *Monosporus pedicellatus* (Smith) Solier & Castagne.

***Neomonospora* sp.**

Sénégal (59).

***Neuroglossum binderianum* Kützing**

Namibia (348).

***Nitophyllum dentatum* Bornet**

Sénégal (89;132).

*Note.* Bornet (89: 293–294) quoted the description direct from Schousboe, but the latter's name was *Areolaria dentata* Schousboe, ‘Tanger. Rarissime reperi inter Algas ad Dar Hamra circa Tingin lectas mense augusto . . . petris calcareis vel Lithophytis innatum’. Dangeard (118), in an addendum concerning *Myriogramme costata* and *Nitophyllum dentatum*, comments on the close similarity of these two taxa. His *Myriogramme* had numerous teeth, close together and a polystromatic frond centrally. In Bornet's description of *N. dentata*, the teeth are only few and sparse, and the frond distromatic centrally. See note under *Myriogramme dentata* Schousboe.

***Nitophyllum fissum* (Greville) J. Agardh**

See *Hymenema venosa* (Linnaeus) Kylin.

***Nitophyllum laceratum* (Gmelin) Greville**

‘. . . in oceano Atlantico ab oris Angliae usque ad Senegalliam. . .’ (25;132).

*Note.* It is likely that this taxon is attributable to *Cryptopleura ramosa* (Hudson) Kylin ex Newton.

***Nitophyllum punctatum* (Stackhouse) Greville**

Canaries (13;226;227;584;598;633;634;662;684).

Mauritanie (624).

‘Nordwestafrika’ (499).

[As *Nitophyllum punctatum* (Stackhouse) Greville var. *ocellata* J. Agardh]

‘. . . Atlantic Ocean (. . . African. . .coasts, Canary Islands)’ (177).

***Nitophyllum uncinatum* (Turner) J. Agardh**

See *Acrosorium uncinatum* (J. Agardh) Kylin (now *A. venulosum* (Zanardini) Kylin).

***Nitophyllum venosum* Harvey**

See *Hymenema venosa* (Linnaeus) Kylin.

***Nitophyllum* sp.**

Angola (41;352).

Sénégal (59;122;529).

[As *Nitophyllum* sp. A]

Guinea-Bissau (529).

Sénégal (529).

*Note.* Dangeard (122) and Sourie (529) suggest that this species was 'voisin de *N. punctatum* (Stackh.) Greville'.

### **Nothogenia erinacea** (Turner) Parkinson

Namibia (32A;36B).

[As *Chaetangium erinaceum* (Turner) Papenfuss]

Namibia (348;438).

[As *Chaetangium ornatum* (Linnaeus) Kützing]

Namibia (128;160;348;453;500).

*Note.* According to Seagrief (570) *Chaetangium dichotomum* Kützing (1869), *Chaetangium hystrix* (C. Agardh) Kützing (1869) and *Chaetangium ornatum* (L.) Kützing are all synonyms of *C. erinaceum*.

### **Nothogenia magnifica** (Pilger) J.H. Price **comb. nov.**

Basionym: *Chaetangium magnificum* Pilger in *Hedwigia* **48**: 181–182, fig. C 1–3 (1908).

[As *Chaetangium magnificum* Pilger]

Namibia (139;348;429;453;500).

[As *Chaetangium magnificum* (Linnaeus) Kützing]

Namibia (160).

[As *Chaetangium ornatum* (Linnaeus) Kützing]

Namibia (429).

*Note.* The recombination is made here as there seems good reason to doubt the conspecificity of *Chaetangium magnificum* with that previously known often as *Chaetangium ornatum* (Linnaeus) Kützing [now *Nothogenia erinacea* (Turner) Parkinson, q.v.]. Papenfuss (429: 11) considered Pilger's (453) '*Chaetangium magnificum*' a synonym under '*Chaetangium ornatum*'.

### **Nothogenia ovalis** (Suhr) Parkinson

Namibia (32A).

[As *Chaetangium ovale* (Suhr) Papenfuss]

Namibia (348;437).

'... Luderitz [S.W.A.] to Storms River mouth [S.A.]. . . more common on the west coast. . .' (523).

### **Olivia ustulata** (Montagne) Montagne

See *Caulacanthus ustulatus* (Turner) Kützing.

### **Ophidocladus simpliciusculus** (P. & H. Crouan) Falkenberg

Canaries (71;191;227;488;598).

Mauritanie (349).

Namibia (36B).

Western Sahara (349).

'... Atlantique (de la Bretagne aux Canaries). . .' (33).

'Subtropical Africa [Senegal (N. of Gambia); Mauritania; Former W. Sahara]' (598).

[As *Polysiphonia* (?) *simpliciuscula* Crouan frat.]

Canaries (547).

### **Orcasia pulla** Simons

See *Streblocladia comptoclada* (Montagne) Falkenberg.

### **Osmundaria volubilis** (Linnaeus) R.E. Norris

[As *Vidalia volubilis* (Linnaeus) J. Agardh]

Canaries (439).

*Note.* This striking and unmistakable species has only been found during the research trip of the Italian vessel 'Corsaro' (439). During that trip many collections were also made in the Mediterranean, an area where *Osmundaria volubilis* is common. It cannot be discounted that a labelling error might have occurred, so accounting for the record.

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# Studies on the Cretan flora 3. Additions to the flora of Karpathos

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**SYNOPSIS.** Floristic notes are provided for 47 taxa, of which 42 were recorded by the authors in April 1992 as new to the South Aegean island of Karpathos. These were first published in *Flora of the Cretan area: annotated checklist & atlas* (Turland, Chilton & Press, 1993), but without comprehensive details of collections or observations, which are instead provided here. Of the 42 taxa, 36 are new to the whole Karpathos island group (Karpathos, Kasos, Saria and adjacent islets). Of these, *Ranunculus cupreus* Boiss. & Heldr. was previously considered endemic to Crete, *Bellevalia trifoliata* (Ten.) Kunth is confirmed as present in the Cretan area (the above islands together with Crete itself), *Scilla bifolia* L. is new to the Cretan area, and *Asyneuma giganteum* (Boiss.) Bornm. is new to Europe (previously known only from the East Aegean islands). Details are also provided confirming the occurrence of five taxa which were formerly known in the Karpathos island group only from old (pre-1930) records.

## INTRODUCTION

The island of Karpathos lies in the South Aegean region some 75 km to the north-east of Crete. At 48 km long and up to 12 km wide (305 km<sup>2</sup>), it is the largest component of the Karpathos island group (Fig. 1), which also includes Kasos (18 km × 6 km) and Saria (9 km × 6 km). This archipelago, together with Crete and its satellite islands, comprise the floristic territory of the Cretan area ('Cr') as defined in *Flora Europaea* (Tutin et al., 1964–1980) and the *Med-Checklist* (Greuter, Burdet & Long, 1984–1989).

Karpathos lies on a north-south axis and reaches 1215 m on the calcareous mass of Mount Kalilimni, which is located more or less in the centre of the island. On the eastern side, at c. 700 m, is the upland plain of Lastos, much of which was formerly under cultivation, while on the western side are vertical cliffs and steep rocky slopes above woods of *Pinus brutia* Ten. The area north of Kalilimni consists of a steep-sided ridge with several summits over 500 m, more pinewoods (largely burnt) and extensive exposure of schistose rock. In the northernmost part of Karpathos are located the villages of Avlona, Diafani and Olimbos, which lacked vehicular access until 1975, and where traditional cultivation of cereals on narrow hillside terraces is still practised. The region south of Kalilimni is less precipitous topographically and contains a large proportion of the island's cultivated land. On the eastern coast is Pigadia, the principal population centre (also known as Karpathos). The southernmost part of the island is low-lying and more or less flat, with some cultivated fields, but mainly large expanses of very dry, exposed calcareous phrygana.

*Flora of the Cretan area: annotated checklist & atlas* (Turland, Chilton & Press, 1993) was published as a first product of the European Plant Information Centre (EPIC) at The Natural History Museum. In this checklist, the total number of native vascular plant species recorded from the island group is given as 905, of which 10 (1.11%) are endemic and 32 (3.54%) endemic to the Cretan area. There are also 26 introduced species.

Of the taxa dealt with in the present paper, 42 were recorded as additions to the flora of Karpathos in Turland et al. (1993), as a result of a field trip to the island by the present authors in April 1992. Comprehensive details of collections or observations were not included in the checklist because of its concise format, and are instead provided here. During the field trip, the present authors also confirmed the occurrence of five taxa which were formerly known in the Karpathos island group only from old (pre-1930) records. They too are listed here together with full details.

Taxonomy and nomenclature follow *Flora of the Cretan area*. Page references to the text and distribution maps contained in that work are provided for each taxon, using the acronym 'FCA'. The sequence of localities of collections or observations runs from north to south. Transliteration of Greek place names follows Turland (1992), which in turn follows official Greek usage. The aim is to provide the closest possible phonetic equivalent to the Greek pronunciation without resorting to unwieldy letter combinations. In order to avoid repetitiveness in citing the records, the collectors 'Chilton & Turland' are abbreviated to 'C. & T.' and 'observation' to 'obs.' All collections have been lodged at The Natural History Museum (BM).

## FLORISTIC NOTES

### Pteridophyta

### Aspleniaceae

*Asplenium ruta-muraria* L. subsp. *ruta-muraria* (new to the Karpathos island group – FCA: 31, 200)



Fig. 1 The Karpathos island group, showing localities mentioned in the text, and the mapping grid used by Turland et al. (1993). The basic, unadjusted square size is 8.25 km × 8.25 km.



W. of summit of Mt Kalilimni, 1150 m, crevices of W.-facing calcareous cliff, 9 April 1992, C. & T. 307 (living material, no longer extant).

This small north temperate fern also occurs in the three main mountain massifs of Crete (Lefka Ori, Psiloritis and Dikti).

## Spermatophyta

### Angiospermae

#### Dicotyledones

#### Apocynaceae

**Vinca major** L. subsp. **major** (new to the Karpathos island group – FCA: 36, 206)

Aperi village, 300 m, side of road, 7 April 1992, C. & T. obs.; 2 km NNW of Piles, 250 m, abandoned cultivated ground, 6 April 1992, C. & T. obs.

This evergreen subshrub is cultivated for ornament in Crete and occasionally becomes naturalized. It occurs as a native plant in western and central parts of the Mediterranean region.

#### Araliaceae

**Hedera helix** L. (new to the Karpathos island group – FCA: 37, 206)

Piles village, 300 m, wall at side of road, 6 April 1992, C. & T. obs.

*Hedera helix* is widespread in Crete as subsp. *helix* (with blackish fruits) and is a native plant in woodland and on cliffs. The species also occurs on walls in Cretan towns and villages, where it may sometimes be planted, either as subsp. *helix* or subsp. *poëtarum* Nyman (with orange-yellow fruits). In Karpathos it was observed only at the cited locality – a man-made habitat – which suggests that its native status on the island is doubtful. In the absence of fruits, the plants could not be identified to subspecific rank. Outside the Cretan area the species is distributed in temperate parts of Europe and Asia.

#### Boraginaceae

**Lithospermum sibthorpiatum** Griseb. (confirmation for the Karpathos island group – FCA: 40)

*Buglossoides arvensis* subsp. *sibthorpiana* (Griseb.) R. Fern.

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, among cereal crop on cultivated terrace, 8 April 1992, C. & T. 291; SE side of summit of Mt Kalilimni, 1150 m, soil-patch in calcareous phrygana, 9 April 1992, C. & T. 304; E. slope of Mt Kalilimni, 900 m, small open area in dry stream-bed surrounded by garigue of *Phlomis floccosa* D. Don and *Sarcopoterium spinosum* (L.) Spach, 5 April 1992, C. & T. 247; 1.5 km E. of Lastos plain, 700 m, bare soil at side of track, 9 April 1992, C. & T. obs.

This annual species was given for Karpathos by Greuter et al. (1983: 49, as *Lithospermum arvense* L.) purely on the basis of

an old record from Mount Kalilimni cited by Rechinger (1943a: 455, as *Lithospermum arvense* var. *sibthorpiatum* (Griseb.) Halácsy). *L. sibthorpiatum* is related to *L. arvense* and *L. incrassatum* Heldr. ex Guss. (*Buglossoides arvensis* subsp. *gasparrinii* (Heldr. ex Guss.) R. Fern.) These two species are unknown in the Karpathos island group, although they do occur in Crete together with *L. sibthorpiatum*.

### Cactaceae

**Opuntia ficus-barbarica** A. Berger (new to the Karpathos island group – FCA: 41, 212)

*O. ficus-indica* sensu *Flora Europaea*

Road entrance to Olimbos village, 350 m, field-margins, 7 April 1992, C. & T. obs.; Aperi village, 300 m, 7 April 1992, C. & T. obs.; 1.5 km W. of Menetes, 350 m, near side of road, 10 April 1992, C. & T. obs.

*Opuntia ficus-barbarica* was introduced to the Mediterranean region from tropical America. It is planted in Crete and also naturalized in cultivated and waste areas, usually near human habitation.

### Campanulaceae

**Asyneuma giganteum** (Boiss.) Bornm. (new to Europe – FCA: 42, 213)

W. of summit of Mt Kalilimni, 1150 m, crevices of W.-facing calcareous cliff, 9 April 1992, C. & T. 311 (living material, in hort. Turland).

*Asyneuma giganteum* is a monocarpic chasmophyte which occupies a very isolated taxonomic position within the genus (Damboldt, 1978: 71). Its discovery in Karpathos extends the known distribution into Europe, the previously known populations being on the East Aegean islands of Rodos (Damboldt, loc. cit.) and Halki (Carlström, 1987: 97, 223). The population on Mount Kalilimni appears to be extremely small and localized: up to 10 plants were found on one cliff only, all of them diminutive (up to 5 cm high), with only a few leaves and no fertile parts present, or indeed any dead remains of those of the previous growing season. The single plant collected has subsequently grown well in cultivation in Britain. By autumn 1992, it had produced a rosette of numerous leaves and, although still sterile, was clearly identifiable with a fertile specimen collected in Rodos (In monte Prophet Elias (Monte Profeta) prope Salakos, in saxosis calc. 'Turka', c. 600 m, 2 July 1935, Rechinger 8508 (BM!)).

Two other taxa have a similar bi-regional endemic distribution spanning the phytogeographical divide between Europe and Asia: *Astragalus austro-aegaeus* Rech. f. (Leguminosae) is known only from Kasos, Karpathos and Rodos, while *Ophrys umbilicata* subsp. *rhodia* H. Baumann & Künkele (Orchidaceae) is known only from Karpathos and Rodos.

## Caryophyllaceae

**Cerastium brachypetalum** Pers. (new to the Karpathos island group – *FCA*: 45, 218)

Lastos plain, 700 m, fallow field, 5 April 1992, *C. & T.* 241.

This small annual species occurs in the higher mountains of Crete, where two subspecies are known: the endemic subsp. *doerfleri* (Halácsy ex Hayek) P.D.Sell & Whitehead, apparently restricted to Mount Kedros, and the more widespread subsp. *roeseri* (Boiss. & Heldr.) Nyman. Unfortunately it was not possible to identify the Karpathos collection to subspecific rank and it is recorded, for the time being, as the species *sensu lato*. *Cerastium brachypetalum* is widely distributed in western, central and southern Europe where several subspecies have been recognised.

**Sagina apetala** Ard. (new to Karpathos – *FCA*: 49, 223)

1 km NW of Pigadia, sea-level, damp bare sandy mud at edge of *Phragmites* bed, 11 April 1992, *C. & T.* 339.

This is another diminutive annual with a widespread European distribution which includes Crete. The species was first recorded from the Karpathos island group by Greuter et al. (1983: 50), from Kasos.

**Sagina maritima** Don (new to Karpathos – *FCA*: 49, 223)

0.5 km W. of Pigadia, 5 m, damp bare sandy ground by track, 4 April 1992, *C. & T.* 226.

*Sagina maritima* is morphologically similar to the preceding species, but differs in having leaves mucous or very shortly mucronate, rather than distinctly aristate. It occurs along the coasts of most of Europe, including Crete. In common with *Sagina apetala*, it was first recorded from the Karpathos island group by Greuter et al. (1983: 50), from Kasos.

**Stellaria media** (L.) Vill. (confirmation for the Karpathos island group – *FCA*: 53, 228)

Diafani village, sea-level, 8 April 1992, *C. & T.* obs.; road entrance to Olimbos village, 350 m, 7 April 1992, *C. & T.* obs.; 1.5 km SW of Spoa, 300 m, foot of NW-facing calcareous cliff, 7 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; immediately NW of Piles, 300 m, bare stony ground of dry stream-bed by road, 6 April 1992, *C. & T.* 260; immediately W. of Menetes, by church, 350 m, grassy area, 10 April 1992, *C. & T.* obs.; Menetes village, 350 m, 10 April 1992, *C. & T.* obs.

This taxon is the species *sensu stricto* (i.e. subsp. *media sensu Flora Europaea*), which is distributed throughout Europe. The species was given for Karpathos by Greuter et al. (1983: 51) purely on the basis of an old record from Volada cited by Rechinger (1943a: 148). Jalas & Suominen, in *Atlas Florae Europaeae* (1983: 72, map 820), map *Stellaria media sensu lato* from Karpathos (i.e. including *S. cupaniana* (Jord. & Fourr.) Bég., *S. neglecta* Weihe and *S. pallida* (Dumort) Piré), using a symbol indicating the existence of a post-1930 record, but they do not provide a separate map for the species *sensu stricto*.

## Chenopodiaceae

**Beta vulgaris** subsp. *maritima* (L.) Arcang. (new to the Karpathos island group – *FCA*: 54, 230)

Diafani, sea-level, cliff immediately above seashore, 8 April 1992, *C. & T.* obs.; coast WSW of Piles, 5 m, margin of abandoned field above beach, 7 April 1992, *C. & T.* 272.

At the cited localities, the plants appeared to be referable to the native subsp. *maritima*, rather than subsp. *vulgaris*, which occurs as a casual escape from cultivation in both Crete and Karpathos. Subsp. *maritima* occurs along the coasts of western and southern Europe (including Crete), Asia and North Africa, as well as on saline soils inland.

## Compositae (Asteraceae)

**Bellis sylvestris** Cirillo (new to the Karpathos island group – *FCA*: 59, 237)

Lower E. slopes of Mt Kalimni above Lastos plain, 750 m, garigue, 5 April 1992, *C. & T.* obs.; along track from Lastos plain to E. coast, 700 m, garigue, 9 April 1992, *C. & T.* obs.; upper end of Volada village, 470 m, garigue, 5 April 1992, *C. & T.* obs.; W. of Othos, on road to Stes, 450 m, phrygana, 6 April 1992, *C. & T.* 249; immediately W. of Menetes, by church, 350 m, grassy area, 10 April 1992, *C. & T.* obs.

Numerous flowering individuals of this perennial southern European species were observed in Karpathos – enough to suggest that spring is at least part of its main flowering period there. In Crete, the species seems to flower mainly in the autumn, and only rarely in spring.

**Centaurea calcitrapa** L. subsp. *calcitrapa* (new to the Karpathos island group – *FCA*: 61, 240)

0.5 km SE of Olimbos, 350 m, bare ground at side of road, 7 April 1992, *C. & T.* obs.

This biennial plant occurs as a native in southern-central Europe and the Mediterranean region, and is naturalized elsewhere in western and central Europe. It is found in Crete, where it usually grows in weedy habitats similar to the Karpathos locality.

**Rhagadiolus edulis** Gaertn. (new to the Karpathos island group – *FCA*: 71, 253)

Valley 4 km N. of Mt Kimaras, between semi-deserted village and gorge, 100 m, grove of *Pinus brutia* Ten. on valley-floor, growing with *Aristolochia cretica* Lam., *Cyclamen creticum* (Dörf.) Hildebr., *Scaligeria napiformis* (Spreng.) Grande and *Theligonum cynocrambe* L., 8 April 1992, *C. & T.* 298; 1 km SE of Lastos plain, 650 m, rocky ground sheltered by a shrub on margin of abandoned field, 9 April 1992, *C. & T.* 301; 1 km SE of Menetes, 280 m, foot of E.-facing calcareous cliff, 10 April 1992, *C. & T.* obs.

*Rhagadiolus edulis* has not always been separated from *R. stellatus* (L.) Gaertn. *sensu lato*, which is distributed from southern Europe eastwards to Iran and was already known to occur in Kasos and Karpathos (Rechinger, 1943a: 676; Greuter et al., 1983: 54). *R. edulis* was not given for the Karpathos island group by Rechinger (op. cit.: 677), and was not treated



separately by Greuter et al. (loc. cit.) It is characterized by its lyrate divided leaves and glabrous phyllaries and is probably only worthy of separation at varietal rank, if at all. Turland et al. (1993) do not treat it separately, except in their distribution maps. *R. stellatus* sensu stricto, with dentate to incised leaves and pubescent or minutely setulose phyllaries, also occurs in Karpathos, and both taxa occur more or less sympatrically in Crete. *R. edulis* has a tendency to grow in more humid habitats than *R. stellatus* in the Cretan area.

***Tyrimnus leucographus* (L.) Cass.** (new to the Karpathos island group – FCA: 73, 257)

0.25 km SW of Avlona, 300 m, cultivated terraces on calcareous substratum, 8 April 1992, C. & T. obs.; immediately N. of Olimbos, 300 m, field, 8 April 1992, C. & T. obs.; E. side of Mt Kimaras, on Spoa-Olimbos road, 350 m, rocky ground at side of road, 7 April 1992, C. & T. 276.

Old records of this Mediterranean species from Kasos and Karpathos (Rechinger, 1943a: 655) were considered erroneous and were referred to *Carduus argentatus* L. by Greuter et al. (1983: 52). The latter species was also observed by the authors on the terraces at Avlona.

## Crassulaceae

***Crassula alata* (Viv.) A. Berger** (new to the Karpathos island group – FCA: 76, 259)

Beach 1 km NW of Pigadia, sea-level, sandy ground at top of beach, 11 April 1992, C. & T. 335 – det. J.R. Akeroyd.

This minute annual species is currently known in Europe only from the Aegean region (Crete, Karpathos and the Kiklades). Otherwise, it occurs in North Africa and south-western Asia. It was first recorded from Crete by Greuter & Raus (1981: 276), and has not always been distinguished there from the very similar *Crassula tillaea* Lest.-Garl. (Greuter, Matthäs & Risse, 1984: 275–276).

## Cruciferae (Brassicaceae)

***Eruca sativa* Mill.** (new to the Karpathos island group – FCA: 82, 268)

*E. vesicaria* subsp. *sativa* (Mill.) Thell.

1.5 km NE of Lefkos, 100 m, 6 April 1992, C. & T. obs.; 0.5 km SW of Volada, 500 m, 6 April 1992, C. & T. obs.; 2.25 km NNW of Piles, 250 m, 6 April 1992, C. & T. obs.; Pigadia town, 15 m, 4 April 1992, C. & T. obs.

*Eruca sativa* is an annual species widely distributed in the Mediterranean region. It occurs in Crete, where it grows in weed communities on cultivated ground.

***Teesdalia coronopifolia* (J. P. Bergeret) Thell.** (new to the Karpathos island group – FCA: 86, 272)

Lastos plain, 700 m, fallow field, 5 April 1992, C. & T. 240.

This mainly southern European and North African annual is also known from western Crete, where it has been recorded under similar ecological conditions at an altitude of 1050 m on

the Omalos plain in the Lefka Ori massif (Rechinger, 1943b: 79).

## Dipsacaceae

***Knautia integrifolia* (L.) Bertol.** (new to the Karpathos island group – FCA: 86, 273)

Along track from Lastos plain to E. coast, 700 m, 9 April 1992, C. & T. obs.; immediately NE of Stes, 450 m, weed community in olive grove, 6 April 1992, C. & T. obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, C. & T. obs.

*Knautia integrifolia* is an annual species represented in Crete by subsp. *mimica* (Borbás) Greuter, which otherwise occurs in Albania and Greece, and on the East Aegean island of Rodos by subsp. *urvillei* (Coul.) Greuter, which otherwise occurs from Turkey-in-Europe to Palestine. The precise identity of the populations in Karpathos has yet to be ascertained; they could belong to either of these taxa, or possibly to subsp. *integrifolia*, which is distributed mainly in the western and central Mediterranean region, extending eastwards to Bulgaria and Greece.

## Euphorbiaceae

***Euphorbia helioscopia* L.** (new to Karpathos – FCA: 89, 277)

0.25 km SW of Avlona, 300 m, cultivated terraces, 8 April 1992, C. & T. obs.; ravine immediately SW of Diafani, 50 m, 8 April 1992, C. & T. obs.; 5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, C. & T. obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, C. & T. obs.; 1.5 km N. of Airport, 20 m, margin of fallow field, 10 April 1992, C. & T. 324.

This annual species occurs almost throughout Europe (including Crete), North Africa and Asia, and is widely introduced elsewhere. The species was first recorded from the Karpathos island group by Greuter et al. (1983: 57), from Kasos.

## Geraniaceae

***Erodium moschatum* (L.) L'Hér.** (new to the Karpathos island group – FCA: 92, 281)

Olimbos village, 350 m, 7 April 1992, C. & T. obs.; gorge 4.5 km N. of Mt Kimaras, 100 m, 8 April 1992, C. & T. obs.; semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, 8 April 1992, C. & T. obs.; 1.5 km SW of Spoa, 300 m, foot of NW-facing calcareous cliff, 7 April 1992, C. & T. obs.; immediately NE of Stes, 450 m, 6 April 1992, C. & T. obs.; Pigadia town, 15 m, 4 April 1992, C. & T. obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, C. & T. obs.

*Erodium moschatum* is an annual or biennial species widely distributed in Europe (including Crete), North Africa and Asia, and introduced elsewhere.

**Geranium tuberosum** L. subsp. **tuberosum** (new to the Karpathos island group – *FCA*: 93, 282)

Immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, *C. & T.* 253.

This tuberous perennial plant is distributed in southern Europe, North Africa and south-western Asia. It occurs in Crete, where it is characteristic of areas in which traditional methods of cultivation are still practised. The plants typically grow in cultivated and fallow fields, as for example in the fields of the Lasithi plain in the Dikti massif in eastern Crete.

### Guttiferae (Hypericaceae)

**Hypericum perforatum** L. (new to the Karpathos island group – *FCA*: 94, 284)

0.25 km SW of Avlona, 300 m, growing through calcareous rocks of dry-stone wall, 8 April 1992, *C. & T.* 285; 0.5 km E. of Pigadia, 11 April 1992, *C. & T.* obs.; between Menetes and Arkasa, growing through calcareous rocks of dry-stone wall, 10 April 1992, *C. & T.* obs.

*Hypericum perforatum* occurs almost throughout Europe (including Crete), as well as in North Africa and Asia. The plants seen in Karpathos were sterile, but they can nevertheless be referred to this species with confidence.

### Labiatae (Lamiaceae)

**Melissa officinalis** subsp. **altissima** (Sm.) Arcang. (confirmation for the Karpathos island group – *FCA*: 96, 286)

Immediately NE of Stes, 450 m, heap of stones in partly cultivated area, 6 April 1992, *C. & T.* obs.; 2 km NNW of Piles, 250 m, near stream, 6 April 1992, *C. & T.* obs.

*Melissa officinalis* was given for Karpathos by Greuter et al. (1983: 58) purely on the basis of an old record from Othos cited by Rechinger (1943a: 522). Subsp. *altissima* occurs in southern Europe (including Crete), North Africa and south-western Asia.

**Rosmarinus officinalis** L. (new to the Karpathos island group – *FCA*: 99, 289)

0.5 km W. of Volada, by track to Lastos plain, 500 m, one plant at top of bank by track, *C. & T.* obs.; near Piles, 6 April 1992, *C. & T.* obs.

This largely Mediterranean shrub is occasionally cultivated for ornament or culinary use in both Crete and Karpathos, and it is very likely that the few plants seen at the cited localities are deliberately planted individuals rather than native or naturalized. The native status of the species in Crete is similarly doubtful.

**Stachys arvensis** (L.) L. (new to the Karpathos island group – *FCA*: 100, 292)

2 km SE of Aperi, 250 m, 5 April 1992, *C. & T.* obs.

*Stachys arvensis* is found in Europe, Africa, south-western

Asia and America. It occurs in Crete, where it grows among rocks and in stony places.

### Leguminosae (Fabaceae)

**Lathyrus annuus** L. (new to the Karpathos island group – *FCA*: 106, 299)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, among cereal crop on cultivated terrace, 8 April 1992, *C. & T.* 292; immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, *C. & T.* 251; 1 km NW of Pigadia, sea-level, annual community on damp ground at edge of *Phragmites* bed, growing with *Bromus* spp., *Hordeum leporinum* Link, *Medicago* spp. and *Vicia villosa* subsp. *varia* (Host) Corb., 11 April 1992, *C. & T.* 338.

This annual species is distributed from the Mediterranean region eastwards to central Asia. It occurs in Crete, where its usual habitats are much the same as those in Karpathos.

**Lens culinaris** Medik. (confirmation for the Karpathos island group – *FCA*: 107)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, *C. & T.* obs.; 1 km NE of Lefkos, 40 m, fallow field, 6 April 1992, *C. & T.* 264.

*Lens culinaris* is an annual species widely cultivated in Europe, Asia and elsewhere for its edible seeds. The plant was given as cultivated in Karpathos by Greuter et al. (1983: 60) purely on the basis of an old record cited by Ciferri (1944: 61, as *Ervum lens* L.) The plants at both localities cited here are probably no more than relics of cultivation, although those at Lefkos may have become locally naturalized, since the field appeared to have been lying fallow for some years.

**Vicia faba** L. (new to the Karpathos island group – *FCA*: 115)

Lastos plain, 700 m, fields, 5 April 1992, *C. & T.* obs.; Aperi village, 300 m, 7 April 1992, *C. & T.* obs.; 1.5 km W. of Menetes, 350 m, 10 April 1992, *C. & T.* obs.; 1.5 km N. of Airport, 20 m, fields, 10 April 1992, *C. & T.* obs.

*Vicia faba* is cultivated for its edible seeds in both Crete and Karpathos. In Crete, the species also occurs as a casual relic or escape from cultivation, and the records from Karpathos most probably represent such occurrences.

### Malvaceae

**Lavatera cretica** L. (new to the Karpathos island group – *FCA*: 118, 317)

Road entrance to Olimbos village, 350 m, 7 April 1992, *C. & T.* obs.; Pigadia town, 15 m, waste area, 11 April 1992, *C. & T.* 343.

This annual or biennial species is distributed from western Europe through the Mediterranean region to Arabia. It occurs in Crete, where it is most often found in cultivated and waste areas.



**Plantaginaceae**

**Plantago amplexicaulis** Cav. subsp. **amplexicaulis** (new to the Karpathos island group – *FCA*: 124, 323)

E. edge of Pigadia town, 20 m, waste area at side of road, 11 April 1992, C. & T. 344.

This annual plant is found in southern Spain, southern Italy, the South Aegean region (including eastern Crete), North Africa and Cyprus.

**Ranunculaceae**

**Ranunculus cupreus** Boiss. & Heldr. (new to the Karpathos island group – *FCA*: 132, 334)

Summit area of Mt Kalilimni, 1200 m, soil-pockets in calcareous rocky slope, 9 April 1992, C. & T. 306; E. side of Mt Kalilimni, 1000 m, crevices and soil-pockets in calcareous rock-face exposed to N., 5 April 1992, C. & T. 244.

*Ranunculus cupreus* is a tuberous perennial species which, prior to its discovery on Mount Kalilimni in Karpathos, was considered endemic to Crete, where it occurs sporadically from sea-level up to 2200 m. The plants are frequent on Kalilimni above c. 1000 m. The basal leaves are hairy and the undersides of the honey-leaves sometimes copper-tinted – both diagnostic features of *R. cupreus*, and relevant in distinguishing this species from *R. subhomophyllus* (Halácsy) Vierh., which has also been recorded from Mount Kalilimni (Rechinger, 1943a: 190; Strid, 1986: 220). It seems probable that *R. cupreus* in Karpathos has previously been misidentified as *R. subhomophyllus*: the authors observed large numbers of plants of the former but none of the latter during their field trip. Indeed, the accuracy of all records of *R. subhomophyllus* from Karpathos should not be taken for granted. The same could be said of records from Mount Afendis Kavousi in eastern Crete (Rechinger, 1943b: 74; Strid, loc. cit.): this mountain is the type locality of *R. cupreus*, which still occurs there in large numbers (clearly agreeing with the Kalilimni material), whereas *R. subhomophyllus* has not yet been found there by either of the authors.

**Resedaceae**

**Reseda luteola** L. (confirmation for the Karpathos island group – *FCA*: 134, 336)

2.5 km N. of Mt Kimaras, 200 m, hard bare ground on track, 8 April 1992, C. & T. 296; 2 km NW of Pigadia, 10 m, roadside bank, 4 April 1992, C. & T. obs.

This biennial species was given for Karpathos by Greuter et al. (1983: 66) purely on the basis of an old record from the Olimbos area cited by Rechinger (1943a: 245). It occurs in Europe (including Crete) and North Africa eastwards to central Asia.

**Scrophulariaceae**

**Linaria chalepensis** (L.) Mill. (new to the Karpathos island group – *FCA*: 142, 348)

5.5 km S. of Olimbos, cultivated area at head of valley running to NNW, 200 m, 8 April 1992, C. & T. obs.

*Linaria chalepensis* is an annual species found in the Mediterranean region and south-western Asia. It occurs in Crete, where it grows as a weed of cultivated areas.

**Scrophularia peregrina** L. (new to Karpathos – *FCA*: 143, 349)

Gorge 4.5 km N. of Mt Kimaras, 100 m, 8 April 1992, C. & T. obs.; semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, 8 April 1992, C. & T. obs.; Aperi village, 300 m, 7 April 1992, C. & T. obs.; immediately NW of Piles, 300 m, heap of soil and stones by dry stream-bed by road, 6 April 1992, C. & T. 259; 0.5 km E. of Pigadia, 11 April 1992, C. & T. obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, C. & T. obs.

This annual species is found mainly in the Mediterranean region, including Crete, where it grows in rocky places and weed communities mainly in the west of the island. In the Karpathos island group, it is known from an old record from Kasos cited by Rechinger (1943a: 477), and was recorded as new to Saria by Greuter et al. (1983: 68). It appears to have been hitherto overlooked in Karpathos, however, in spite of its moderately frequent occurrence there.

**Umbelliferae (Apiaceae)**

**Smyrniolus olusatrum** L. (new to the Karpathos island group – *FCA*: 153, 363)

Aperi village, 300 m, dry-stone wall at side of road, 7 April 1992, C. & T. 267; Piles village, 300 m, 6 April 1992, C. & T. obs.; Menetes village, 350 m, 10 April 1992, C. & T. obs.

*Smyrniolus olusatrum* is a biennial species distributed mainly in the Mediterranean region. It occurs in Crete, where it is often found in or around villages.

**Monocotyledones****Agavaceae**

**Agave americana** L. (new to the Karpathos island group – *FCA*: 157, 368)

Diafani village, 8 April 1992, C. & T. obs.

This large succulent perennial was introduced to the Mediterranean region from Mexico. It is cultivated in Crete and is possibly also naturalized on roadsides and near villages. The exact status of the population at Diafani is uncertain.

## Cyperaceae

**Carex illegitima** Ces. (new to the Karpathos island group – *FCA*: 160, 372)

2.5 km N. of Mt Kimaras, 200 m, steep slope of stream gully in area of burnt *Pinus brutia* woodland, forming clumps amongst regenerating vegetation of *Arbutus unedo* L., *Pistacia lentiscus* L. and *Cistus* on schistose substratum, 8 April 1992, C. & T. 295; along track from Lastos plain to E. coast, 700 m, in field layer of very open *Pinus brutia* woodland, 9 April 1992, C. & T. obs.

This mainly eastern Mediterranean sedge was considered doubtfully present in the Cretan area until recorded by Turland (1992: 163) from the lower western slopes of Mount Afendis Kavousi in eastern Crete where, as in Karpathos, it grows in *Pinus brutia* woodland.

## Gramineae (Poaceae)

**Bromus diandrus** Roth (new to the Karpathos island group – *FCA*: 165, 378)

Immediately NE of Stes, 450 m, weed community at side of track, 6 April 1992, C. & T. 250; 1 km NW of Pigadia, sea-level, annual community on damp ground at edge of *Phragmites* bed, 11 April 1992, C. & T. obs.; Pigadia town, 15 m, 4 April 1992, C. & T. obs.; immediately W. of Menetes, by church, 350 m, 10 April 1992, C. & T. obs.

*Bromus diandrus* is an annual grass found in southern Europe, North Africa and south-western Asia. It occurs in Crete, growing in a variety of disturbed habitats.

**Bromus hordeaceus** subsp. **divaricatus** (Bonnier & Layens) Kerguélen (new to the Karpathos island group – *FCA*: 166, 379)

*B. hordeaceus* subsp. *molliformis* (Lloyd ex Godr.) Maire & Weiller

1.5 km N. of airport, 20 m, fallow field, 10 April 1992, C. & T. 323 – det. M.H. Martin (University of Bristol).

This annual Mediterranean grass also occurs in Crete, where it grows in marshes, damp grassland and sandy alluvial soils, as well as fallow fields.

**Hordeum spontaneum** K. Koch (new to the Karpathos island group – *FCA*: 171, 385)

Immediately W. of Menetes, by church, 350 m, 10 April 1992, C. & T. obs.; immediately E. of Menetes, 340 m, waste ground at side of road, 10 April 1992, C. & T. 317; 1.5 km N. of Airport, 20 m, side of road, 10 April 1992, C. & T. obs.

Greuter, Matthäs & Risse (1985: 36) suggested that this annual grass is 'actively spreading as a roadside weed in Greece and on many Greek islands'. The same authors (loc. cit.) considered it to be fairly recently introduced to Crete, and now naturalized there. Elsewhere, it is known from Libya, Egypt and south-western and central Asia.

**Imperata cylindrica** (L.) Raeusch. (new to the Karpathos island group – *FCA*: 171, 386)

1.5 km SW of Piles, 20 m, wet ditch at side of road, 6 April 1992, C. & T. obs.; 1 km NW of Pigadia, sea-level, damp ground at edge of *Phragmites* bed, 11 April 1992, C. & T. 340.

This rhizomatous perennial grass is distributed from southern Europe to central Asia, as well as in the Old World tropics and subtropics and Chile. In Crete, it occurs in damp sandy places, ditches and moist grassland near the sea.

**Lamarckia aurea** (L.) Moench (new to Karpathos – *FCA*: 171, 386)

Semi-deserted village 3.5 km N. of Mt Kimaras, 150 m, fallow cultivation terrace, 8 April 1992, C. & T. 300; S. edge of Pigadia town, 25 m, weed community in olive groves, 11 April 1992, C. & T. obs.

*Lamarckia aurea* is an annual grass found from the Mediterranean region (including Crete) eastwards to Pakistan. It was first recorded from the Karpathos island group by Greuter et al. (1983: 72), from Saria.

## Iridaceae

**Romulea ramiflora** Ten. subsp. **ramiflora** (new to Karpathos – *FCA*: 179, 396)

Lastos plain, 700 m, fallow field, growing with *Romulea bulbocodium* (L.) Sebast. & Mauri, 9 April 1992, C. & T. 302.

This geophyte is distributed in the Mediterranean region, including Crete, and was first recorded from the Karpathos island group by Greuter et al. (1983: 74), from Kasos.

## Liliaceae

**Bellevalia trifoliata** (Ten.) Kunth (new to the Karpathos island group, and confirmation for the Cretan area – *FCA*: 182, 401)

Lastos plain, 700 m, scrub, 5 April 1992, C. & T. obs.; 1 km SE of Lastos plain, 650 m, near margin of abandoned field, 5 April 1992, C. & T. 237; area immediately NE of Stes, 450–470 m, several populations in olive groves, margin of scrub and abandoned fields, 6 April 1992, C. & T. obs.; immediately W. of Menetes, by church, 350 m, abandoned terraces, 10 April 1992, C. & T. obs.

This Mediterranean bulbous species is given as doubtfully present in the Cretan area by Heywood (1980: 45), presumably on the basis of an old record from Crete cited by Rechinger (1943a: 728) and doubted by Greuter (1974: 161). The new records from Karpathos confirm the presence of the species in the Cretan area. Furthermore, the authors have recently received confirmation of the occurrence of the species in Crete itself (Apokoronos: S. of Vrises, by road to Hora Sfakion, beneath olive tree in stony field, 10 April 1993, *I. Palmer* colour transparency!).

Greuter (1974: 161) also casts doubt upon old records of *Bellevalia dubia* (Guss.) Rchb. cited by Rechinger (1943a:



728) from Kasos. This species has a distribution similar to that of *B. trifoliata* and is likewise given by Heywood (1980: 45) as doubtfully present in the Cretan area. Its occurrence there has recently been confirmed by a record from the Korikos peninsula in north-western Crete (Strasser, 1988: 6, 22), although its presence in Kasos remains doubtful. It is possible that the records from that island are in fact referable to *B. trifoliata*.

***Scilla bifolia* L.** (new to the Cretan area – *FCA*: 185, 406)

W. of summit of Mt Kalimni, 1100 m, head of valley beneath W.-facing cliffs, among low open scrub of *Acer sempervirens* L., 9 April 1992, C. & T. 308; immediately S. of col S. of summit of Mt Kalimni, 1150 m, in protection of spiny shrub beneath NW-facing calcareous cliffs, 5 April 1992, C. & T. 246.

This small bulbous species is widely distributed in central and southern Europe and south-western Asia. It occurs throughout most of Greece and on several of the Aegean islands (Andersson, 1991: 695). However, before its discovery in Karpathos, it was known in the South Aegean region only on the island of Rodos, where it has been recorded at altitudes of 1000–1200 m on Mount Attavros south-south-east of Embonas by Carlström (1987: 119, 260), as *Scilla* 'longistyla' Speta, a mis-print of *S. longistylota* Speta, which is included within *S. bifolia* by Mordak (1984: 216). The plants occur in large numbers at the first cited locality on Kalimni, and it is intriguing that this conspicuous and attractive species has been overlooked there for so long. In the high mountains of Crete (Lefka Ori, Kedros, Psiloritis, Dikti and Afendis Kavousi massifs) *Scilla bifolia* is unknown, even under ecological conditions analogous to the Kalimni locality. Instead, there occurs the endemic *Scilla nana* (Schult. & Schult. f.) Speta (= *Chionodoxa nana* (Schult. & Schult. f.) Boiss. & Heldr., including *C. cretica* Boiss. & Heldr. and *S. albescentis* Speta).

## Typhaceae

***Typha domingensis* (Pers.) Steud.** (new to the Karpathos island group – *FCA*: 195, 416)

2.5 km N. of Mt Kimaras, 200 m, wet stream-bed in area of burnt *Pinus brutia* woodland, 8 April 1992, C. & T. obs.

*Typha domingensis* is a hygrophilous species distributed in the Mediterranean region, Asia, tropical Africa and tropical America. It occurs in Crete, growing in watery places mainly in the west of the island.

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